AD-A193 223 OPTIMUM SUPPLY AND MAINTENANCE MODEL RELEASE 20 USER'S GUIDE(U) ARMY COMMUNICATIONS-ELECTRONICS COMMAND FORT MONMOUTH NJ C J PLUMERI SEP 87 CECOM-TR-87-3 1/3

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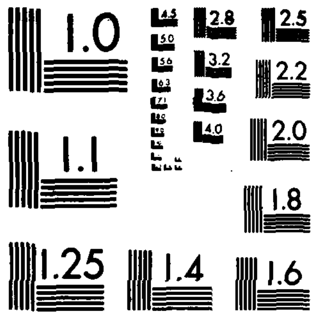

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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SECURITY CLASSIFICATION OF THIS PAGE

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REPORT DOCUMENTATION PAGE

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OPTIMUM SUPPLY AND MAINTENANCE MODEL RELEASE 2.0 USER'S GUIDE (U)

12. PERSONAL AUTHOR(S) Charles J. Plumeri

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
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16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Multipurpose Test Equipment; Optional Allocation; Level of Repair Analysis (LORA) Modelling; Supply and Maintenance Modelling

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The Optimum Supply and Maintenance Model (OSAMM) is designed to simultaneously optimize support and maintenance policies for ~~a~~ new equipment. Inputs to the model are limited to the types of information that should be available early in development when the maintenance concept is being formulated. The model determines optimal Maintenance Task Distribution ~~(MTD)~~ and Replacement Task Distributions ~~(RTD)~~ for the major items in ~~an~~ equipment. It also compares the cost of throwing away an item with the cost of repairs. In making these decisions the model considers the spares, special test equipment and special repairmen that will be needed to support the maintenance policy. Other costs such as transportation, cataloging and documentation are also considered.

The original release of the OSAMM allowed for only one repair time and one set of test equipments and special repairmen to be input for each type of repair action. The model would determine at which maintenance echelon repair should be performed given this one (contd)

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19. ABSTRACT (contd)

method of repair. Release 2.0 contains three run modes, one of which accepts up to three different options for each repair action. The improved model is ~~thus~~ able to trade-off among three repair methods. This capability can be used to analyze such repair actions as common, automatic, and special test equipment to determine how repair should be done as well as where it should be done. The original model remains as one of the run modes of the enhanced model, however.

A third run mode of the enhanced model examines the value of screening or "go-no/go" testing. Screening is used to verify that an item has indeed failed before it is sent back for repair or is discarded. Only one repair method is permitted when the model is run in the screening mode. In this mode, the user identifies those items which are candidates for screening. The model considers any equipment or special repairmen needed, the effectiveness, the time required, the cost of an end-to-end test program set, and the supply implications to determine if screening is cost effective for each item. The decision is not made by looking at each item individually, but is made by considering the system as a whole.

The User's Guide gives a brief description of the model, defines the inputs required, and explains the output. It also contains a chapter which describes the various types of sensitivity analyses that can be performed using the model.

MAIN OUTPUT FILE

OPTIMUM SUPPLY AND MAINTENANCE MODEL PREPROCESSOR

VERSION DATE 87/07/28

RUN DATE 87/09/02.

THIS IS A BASIC RUN

REPAIR END ITEM	LOWEST ECHELON TO REPAIR COMPONENTS	REPAIR MODULES
ORG	ORG	ORG

END ITEM INFORMATION

END ITEM	PRICE	LIFE (YEARS)	OPERATING HOURS	MTBF (HOURS)	MTR (HOURS)	AVAILABILITY TARGET	UNSERVICEABLE RETURN RATE	FALSE REMOVAL DEFAULT
SINCGARS V	8325.	15	730.	1300.	.25	.900	1.00	.10

TAT DEFAULTS (USED ONLY IF TAT IS NOT INPUT WITH EACH COMPONENT OR MODULE)

ORG	DSU	GSU	DEP
1.	3.	30.	120.

THERE ARE NO TEST EQUIPMENTS OR SPECIAL REPAIRMEN NEEDED TO REPAIR THE END ITEM

DEPLOYMENT INFORMATION

RSC	IVSYS	CLAIMANTS ORG	CLAIMANTS DSU	CLAIMANTS GSU	DENSITY	OST ORG-DSU	OST DSU-GSU	OST GSU-DEP	PLT	CONTACT DELAY	OPERATING LEVEL ORG	OPERATING LEVEL DSU	OPERATING LEVEL GSU
6	V	500.	100.	24.	199750.	2.0	40.0	40.0	510.0	760.0	15.0	30.0	30.0

AVERAGE OUPS
399.5 1997.5 8322.9

DISTANCE (MILES) BETWEEN

ORG-DSU	DSU-GSU	GSU-DEPOT
7.	250.	3500.

COST PARAMETERS

LABOR RATES

	ORG	DSU	GSU	DEPOT
BASE	7.06	10.59	34.50	34.50
LOADED	11.86	17.79	50.03	50.03
PROD FAC	.85	.85	.85	.85
EFFECTIVE	13.95	20.93	58.85	58.85

TRANSPORTATION COST

	ORG-DSU	DSU-GSU	GSU-DEPOT
PER LB-MI	.01177	.00034	.00035
PER POUND	.08	.09	1.23

OTHER COSTS

INITIAL CATALOG	RECURRING CATALOG	INITIAL BIN	RECURRING BIN	HOLDING FRACTION	COST PER REQUISITION	COST PER PAGE OF TECH DOC
653.40	162.47	220.16	35.32	.03	23.78	300.00

COST PARAMETERS IN TERMS OF PRESENT VALUE
(PVF = 7.9863835)

LABOR RATE (PRESENT VALUE)

ORG	DSU	GSU	DEPOT
111.44	167.16	470.02	470.02

TRANSPORTATION COST (PRESENT VALUE)

ORG-DSU	DSU-GSU	GSU-DEP
.66	.68	9.78

COSNSN	COSBIN	COSREQ
1795.86	502.24	189.92

EQUIPMENT NUMBER 1

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
COMMON EQ	0.	15	ORG	DSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DSU	34990.	.27	0.	1768.	110440.
GSU	34990.	.27	0.	1768.	110440.
DEP	34990.	.27	0.	1768.	110440.

EQUIPMENT NUMBER 2

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
BREAK BOX	0.	15	DEP	DSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DSU	350.	.05	0.	1768.	490.
GSU	350.	.05	0.	1768.	490.
DEP	350.	.05	0.	1768.	490.

EQUIPMENT NUMBER 3

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
STATIC PAD	0.	15	DEP	DSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DSU	100.	.01	0.	1768.	108.
GSU	100.	.01	0.	1768.	108.
DEP	100.	.01	0.	1768.	108.

EQUIPMENT NUMBER 4

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
REPAIR VAN	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	1160000.	.10	0.	1768.	2086420.
DEP	1160000.	.10	0.	1768.	2086420.

EQUIPMENT NUMBER 5

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD1	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	604.	.12	0.	1768.	1183.
DEP	604.	.12	0.	1768.	1183.

EQUIPMENT NUMBER 6

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 2	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	529.	.12	0.	1768.	1036.
DEP	529.	.12	0.	1768.	1036.

EQUIPMENT NUMBER 7

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 3	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	1387.	.10	0.	1768.	2495.
DEP	1387.	.10	0.	1768.	2495.

EQUIPMENT NUMBER 8

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 4	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	179.	.10	0.	1768.	322.
DEP	179.	.10	0.	1768.	322.

EQUIPMENT NUMBER 9

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 5	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	3622.	.10	0.	1768.	6515.
DEP	3622.	.10	0.	1768.	6515.

EQUIPMENT NUMBER 10

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
TACFIRFICD	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	1500.	.12	0.	1768.	2938.
DEP	1500.	.12	0.	1768.	2938.

EQUIPMENT NUMBER 11

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 6	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	478.	.12	0.	1768.	936.
DEP	478.	.12	0.	1768.	936.

EQUIPMENT NUMBER 12

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 7	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	728.	.12	0.	1768.	1426.
DEP	728.	.12	0.	1768.	1426.

EQUIPMENT NUMBER 13

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 8	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	107.	.12	0.	1768.	210.
DEP	107.	.12	0.	1768.	210.

EQUIPMENT NUMBER 14

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 9	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	334.	.10	0.	1768.	601.
DEP	334.	.10	0.	1768.	601.

EQUIPMENT NUMBER 15

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 10	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON UNIT COST MAINTENANCE INSTALLATION AVAILABLE

GSU	334.	.10	0.	1768.	601.
DEP	334.	.10	0.	1768.	601.

EQUIPMENT NUMBER 16

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 11	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	334.	.10	0.	1768.	601.
DEP	334.	.10	0.	1768.	601.

EQUIPMENT NUMBER 17

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 12	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	334.	.10	0.	1768.	601.
DEP	334.	.10	0.	1768.	601.

EQUIPMENT NUMBER 18

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 13	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	334.	.10	0.	1768.	601.
DEP	334.	.10	0.	1768.	601.

EQUIPMENT NUMBER 19

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
USM-410	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	800000.	.10	0.	1768.	1438911.
DEP	800000.	.10	0.	1768.	1438911.

EQUIPMENT NUMBER 20

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
USM-465	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE

GSU	40000.	.10	0.	1768.	71946.
DEP	40000.	.10	0.	1768.	71946.

EQUIPMENT NUMBER 21

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 14	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	425.	.12	0.	1768.	832.
DEP	425.	.12	0.	1768.	832.

EQUIPMENT NUMBER 22

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ICD 15	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	390.	.12	0.	1768.	764.
DEP	390.	.12	0.	1768.	764.

COMPONENT INFORMATION

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
1	1	1000	RT	5163.	10.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	56.	0.	.00	0.	3

EQ/REP NUM	TIME USED
1	.50
2	.50
3	.50

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
2	2	2000	PWER AMP	1008.	9.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	144.	0.	.00	0.	4

EQ/REP NUM	TIME USED
4	.50
16	.50
19	.50
21	.50

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
3	3	3000	ECCM	868.	.75	1	NO	.050	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.09	2975.	0.	.00	0.	3

EQ/REP NUM	TIME USED
4	.50
5	.50
20	.50

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
4	4	5000	VEH MOUNT	1960.	42.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	56.	0.	.00	0.	3

EQ/REP NUM	TIME USED
1	.50
2	.50
3	.50

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
5	5	6000	IVRCU	840.	3.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	56.	0.	.00	0.	3

EQ/REP NUM	TIME USED
1	.50
[illegible]	[illegible]

PSEUDO COMPONENTS

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	AVERAGE PRICE	WEIGHT	ESS	FALSE REMOVAL	TOTAL PARTS	NEW PARTS	MTHF	FAILURES PER YEAR
6	6	7000	MAN ANT	76.	.80	1	.10	1	1	14752.	.495E-01
7	7	8000	VEN ANT	112.	2.43	1	.10	3	3	2726.	.268E+00
8	8	9000	HAT CASE	115.	1.50	1	.10	1	1	18440.	.396E-01

THERE ARE 8 COMPONENTS

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
9	1	1001	CHASIS	1409.	5.00	1	NO	.050	.10	1.	3.	30.	120.	1	96.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	779.	0.	.00	0.	3

EQ/REP NUM	TIME USED
4	.50
9	.50
20	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
10	2	1002	CONTROL	382.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	14.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	1594.	0.	.00	0.	3

EQ/REP NUM	TIME USED
4	.50
6	.50
20	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
11	3	1003	PWR ASSY	190.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	13.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	221.	0.	.00	0.	5

EQ/REP NUM	TIME USED
4	.50
12	.50
13	.50
10	.50
19	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
12	4	1004	TUNER/MIX	394.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	28.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	193.	0.	.00	0.	4

EQ/REP NUM	TIME USED
4	.50
10	.50
11	.50
19	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
13	5	1005	IF DEMOD	359.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	19.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	168.	0.	.00	[illegible]	4

```
                EQ/REP NUM     TIME USED
                     4              .50
                    10              .50
                    11              .50
                    19              .50

REF MOD   MOD    MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT            NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP   ALT   NEW PARTS    PER REPAIR
 14   6  1006  EXCITER         965.      .42    1    NO    .050       .10       1.   3.   30.  120.   1         0.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES       TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
         1      ALT1       .50     .00        671.           0.          .00          0.               5

                EQ/REP NUM     TIME USED
                     4              .50
                    10              .50
                    12              .50
                    13              .50
                    19              .50

REF MOD   MOD    MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT            NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP   ALT   NEW PARTS    PER REPAIR
 15   7  1007  SYNTHESIS       540.      .42    1    NO    .050       .10       1.   3.   30.  120.   1        32.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES       TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
         1      ALT1       .50     .00        394.           0.          .00          0.               5

                EQ/REP NUM     TIME USED
                     4              .50
                    10              .50
                    12              .50
                    13              .50
                    19              .50

REF MOD   MOD    MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT            NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP   ALT   NEW PARTS    PER REPAIR
 16   8  1008  TWO-WIRE        171.      .42    1    NO    .050       .10       1.   3.   30.  120.   1        15.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES       TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
         1      ALT1       .50     .00        203.           0.          .00          0.               4

                EQ/REP NUM     TIME USED
                     4              .50
                    10              .50
                    11              .50
                    19              .50

REF MOD   MOD    MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT            NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP   ALT   NEW PARTS    PER REPAIR
 17   9  1009  SW ASSY         406.      .42    1    NO    .050       .10       1.   3.   30.  120.   1        19.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES       TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
         1      ALT1       .50     .00       1080.           0.          .00          0.               4

                EQ/REP NUM     TIME USED
                     4              .50
                    10              .50
                    11              .50
                    19              .50
```

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
18	10	1010	REMOTE I/O	243.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	4.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	1223.	0.	.00	0.	3

EQ/REP NUM	TIME USED
4	.50
6	.50
20	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
19	11	1011	CON MATCH.	185.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	17.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	257.	0.	.00	0.	5

EQ/REP NUM	TIME USED
4	.50
10	.50
11	.50
13	.50
19	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
20	12	1012	AUD PS	223.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	7.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	156.	0.	.00	0.	5

EQ/REP NUM	TIME USED
4	.50
10	.50
11	.50
13	.50
19	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
21	13	1013	AUD I/O	271.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	10.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	173.	0.	.00	0.	5

EQ/REP NUM	TIME USED
4	.50
10	.50
11	.50
13	.50
19	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
22	14	1014	AUD CON	198.	.42	1	NO	.050	.10	1.	3.	30.	120.	1	7.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	453.	0.	.00	0.	3

EQ/REP NUM TIME USED

```
                  4              .50
                  5              .50
                 20              .50

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT             NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 23  15  2001  CHAS FILT        658.      6.00   1    NO    .050      .10        1.   3.   30. 120.    1        10.          25.00

          ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
            1     ALT1      .50     .00         172.            0.        .00          0.                3

                  EQ/REP NUM    TIME USED
                      4              .50
                     16              .50
                     19              .50

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT             NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 24  16  2002  AMP BD           333.      1.75   1    NO    .050      .10        1.   3.   30. 120.    1        12.          25.00

          ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
            1     ALT1      .50     .00         130.            0.        .00          0.                4

                  EQ/REP NUM    TIME USED
                      4              .50
                     17              .50
                     19              .50
                     21              .50

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT             NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 25  17  2003  DECODER          168.      1.75   1    NO    .050      .10        1.   3.   30. 120.    1         1.          25.00

          ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
            1     ALT1      .50     .00         146.            0.        .00          0.                3

                  EQ/REP NUM    TIME USED
                      4              .50
                     18              .50
                     19              .50

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT             NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 26  18  5001  ONE-WATT         496.      5.00   1    NO    .050      .10        1.   3.   30. 120.    1        19.          25.00

          ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
            1     ALT1      .50     .00         150.            0.        .00          0.                3

                  EQ/REP NUM    TIME USED
                      4              .50
                     14              .50
                     19              .50

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS    WASH     FALSE            TAT             NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 27  19  5002  PWR SUPP         406.      1.50   1    NO    .050      .10        1.   3.   30. 120.    1        22.          25.00

          ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
            1     ALT1      .50     .00         194.            0.        .00          0.                4

                  EQ/REP NUM    TIME USED
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                 4          .50
                15          .50
                19          .50
                22          .50

REF MOD  MOD   MODULE      UNIT    WEIGHT  ESS  HAS  WASH    FALSE            TAT            NUM   NUM OF     PARTS COST
NUM NUM  ID     NAME       PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS  PER REPAIR
 28  20  5003  PA CHASIS    941.    26.00   1   NO   .050     .10      1.   3.   30.  120.   1      80.         25.00

      ALT#   NAME    MTTR  DIAG TIME   PAGES     TPS DEV    TPS MAINT   TPS PV    NUMBER OF EQUIP/REP
       1     ALT1    .50     .00        355.          0.       .00         0.              3

             EQ/REP NUM    TIME USED
                 4          .50
                 7          .50
                20          .50

REF MOD  MOD   MODULE      UNIT    WEIGHT  ESS  HAS  WASH    FALSE            TAT            NUM   NUM OF     PARTS COST
NUM NUM  ID     NAME       PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS  PER REPAIR
 29  21  6001  ANALOG       153.      .38   1   NO   .050     .10      1.   3.   30.  120.   1       5.         25.00

      ALT#   NAME    MTTR  DIAG TIME   PAGES     TPS DEV    TPS MAINT   TPS PV    NUMBER OF EQUIP/REP
       1     ALT1    .50     .00        165.          0.       .00         0.              5

             EQ/REP NUM    TIME USED
                 4          .50
                10          .50
                11          .50
                13          .50
                19          .50

REF MOD  MOD   MODULE      UNIT    WEIGHT  ESS  HAS  WASH    FALSE            TAT            NUM   NUM OF     PARTS COST
NUM NUM  ID     NAME       PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS  PER REPAIR
 30  22  6002  IVRCU PS      91.      .38   1   NO   .050     .10      1.   3.   30.  120.   1       8.         25.00

      ALT#   NAME    MTTR  DIAG TIME   PAGES     TPS DEV    TPS MAINT   TPS PV    NUMBER OF EQUIP/REP
       1     ALT1    .50     .00        164.          0.       .00         0.              5

             EQ/REP NUM    TIME USED
                 4          .50
                10          .50
                11          .50
                13          .50
                19          .50

REF MOD  MOD   MODULE      UNIT    WEIGHT  ESS  HAS  WASH    FALSE            TAT            NUM   NUM OF     PARTS COST
NUM NUM  ID     NAME       PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS  PER REPAIR
 31  23  6003  DECOD/TIM    120.      .38   1   NO   .050     .10      1.   3.   30.  120.   1       2.         25.00

      ALT#   NAME    MTTR  DIAG TIME   PAGES     TPS DEV    TPS MAINT   TPS PV    NUMBER OF EQUIP/REP
       1     ALT1    .50     .00        526.          0.       .00         0.              3

             EQ/REP NUM    TIME USED
                 4          .50
                 6          .50
                20          .50

REF MOD  MOD   MODULE      UNIT    WEIGHT  ESS  HAS  WASH    FALSE            TAT            NUM   NUM OF     PARTS COST
NUM NUM  ID     NAME       PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS  PER REPAIR
 32  24  6004  MICRO        185.      .38   1   NO   .050     .10      1.   3.   30.  120.   1       2.         25.00
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ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	789.	0.	.00	0.	3

EQ/REP NUM	TIME USED
4	.50
5	.50
20	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
33	25	6005	IVRCU CHAS	417.	2.00	1	NO	.050	.10	1.	3.	30.	120.	1	25.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	355.	0.	.00	0.	3

EQ/REP NUM	TIME USED
4	.50
8	.50
20	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
34	26	5004	MTG TRAT	411.	10.00	1	NO	.250	.10	1.	3.	30.	120.	1	21.	17.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	5.	0.	.00	0.	0

PSEUDO MODULES

REF NUM	MOD NUM	MOD ID	MODULE NAME	AVERAGE PRICE	WEIGHT	ESS	FALSE REMOVAL	TOTAL PARTS	NEW PARTS
35	27	3001	ECCM PTS	25.	.25	1	.10	55	22

THERE ARE 27 MODULES

APPLICATIONS

REF NUM	APP NUM	COMP NUM	MOD NUM	COMP ID	MOD ID	COMPONENT NAME	MODULE NAME	MTBF	FAILURES PER YEAR	ADD REP ALT
37	1	1	1	1000	1001	RT	CHASIS	14007.	.521E-01	0
38	2	1	2	1000	1002	RT	CONTROL	27863.	.262E-01	0
39	3	1	3	1000	1003	RT	PWR ASSY	25974.	.281E-01	0
40	4	1	4	1000	1004	RT	TUNER/MIX	12943.	.564E-01	0
41	5	1	5	1000	1005	RT	IF DEMOD	18861.	.387E-01	0
42	6	1	6	1000	1006	RT	EXCITER	11741.	.622E-01	0
43	7	1	7	1000	1007	RT	SYNTHESIS	15686.	.465E-01	0
44	8	1	8	1000	1008	RT	TWO-WIRE	22650.	.322E-01	0
45	9	1	9	1000	1009	RT	SW ASSY	12840.	.569E-01	0
46	10	1	10	1000	1010	RT	REMOTE I/O	44405.	.164E-01	0
47	11	1	11	1000	1011	RT	CON MATCH	28818.	.253E-01	0
48	12	1	12	1000	1012	RT	AUD PS	32541.	.224E-01	0
49	13	1	13	1000	1013	RT	AUD I/O	14892.	.490E-01	0
50	14	1	14	1000	1014	RT	AUD CON	21968.	.332E-01	0
51	15	2	15	2000	2001	PWER AMP	CHAS FILT	58850.	.124E-01	0
52	16	2	16	2000	2002	PWER AMP	AMP HD	92326.	.791E-02	0
53	17	2	17	2000	2003	PWER AMP	DECODER	120522.	.606E-02	0
54	18	3	27	3000	3001	ECCM	ECCM PTS	12472.	.585E-01	0
55	19	4	18	5000	5001	VEH MOUNT	ONE-WATT	14350.	.509E-01	0
56	20	4	19	5000	5002	VEH MOUNT	PWR SUPP	30286.	.241E-01	0
57	21	4	20	5000	5003	VEH MOUNT	PA CHASIS	72195.	.101E-01	0
58	22	5	21	6000	6001	IVRCU	ANALOG	151371.	.482E-02	0
59	23	5	22	6000	6002	IVRCU	IVRCU PS	219843.	.332E-02	0
60	24	5	23	6000	6003	IVRCU	DECOD/TIM	291099.	.251E-02	0
61	25	5	24	6000	6004	IVRCU	MICRO	205617.	.355E-02	0
62	26	5	25	6000	6005	IVRCU	IVRCU CHAS	178200.	.410E-02	0
63	27	4	26	5000	5004	VEH MOUNT	MTG TRAT	2273457.	.321E-03	0

THERE ARE 27 APPLICATIONS

THERE ARE 1.09 END ITEM FAILURES PER YEAR
THE DERIVED MTBF IS 669. HOURS
THE INPUT MTBF IS 1300. HOURS

APEX WORKED FINE. SOLUTION OPTIMALITY WITHIN .00 PER CENT OF IDEAL

MAINTENANCE POLICIES BY APPLICATION

APP NUM	COMPONENT NAME	MODULE NAME	REPAIR LEVEL EI	REPAIR LEVEL COMP	REPAIR LEVEL MOD	FRACTION OF TIME	MODULE PROMOTED	SENSITIVITY FLAG
1	RT	CHASIS	ORG	DSU	GSU	1.000		
2	RT	CONTROL	ORG	DSU	GSU	1.000		
3	RT	PWR ASSY	ORG	DSU	GSU	1.000		
4	RT	TUNER/MIX	ORG	DSU	GSU	1.000		
5	RT	IF DEMOD	ORG	DSU	GSU	1.000		
6	RT	EXCITER	ORG	DSU	GSU	1.000		
7	RT	SYNTHESIS	ORG	DSU	GSU	1.000		
8	RT	TWO-WIRE	ORG	DSU	DEP	1.000		
9	RT	SW ASSY	ORG	DSU	GSU	1.000		
10	RT	REMOTE I/O	ORG	DSU	GSU	1.000		
11	RT	CON MATCH	ORG	DSU	DEP	1.000		
12	RT	AUD PS	ORG	DSU	GSU	1.000		
13	RT	AUD I/O	ORG	DSU	GSU	1.000		
14	RT	AUD CON	ORG	DSU	GSU	1.000		
15	PWER AMP	CHAS FILT	ORG	GSU	GSU	1.000		
16	PWER AMP	AMP BD	ORG	GSU	GSU	1.000		
17	PWER AMP	DECODER	ORG	GSU	GSU	1.000		
18	ECCM	ECCM PTS	ORG	GSU	TOSS	1.000		
19	VEH MOUNT	ONE-WATT	ORG	DSU	GSU	1.000		
20	VEH MOUNT	PWR SUPP	ORG	DSU	GSU	1.000		
21	VEH MOUNT	PA CHASIS	ORG	DSU	GSU	1.000		
22	IVRCU	ANALOG	ORG	DSU	TOSS	1.000		
23	IVRCU	IVRCU PS	ORG	DSU	TOSS	1.000		
24	IVRCU	DECOD/TIM	ORG	DSU	TOSS	1.000		
25	IVRCU	MICRO	ORG	DSU	GSU	1.000		
26	IVRCU	IVRCU CHAS	ORG	DSU	GSU	1.000		
27	VEH MOUNT	MTG TRAT	ORG	DSU	DSU	1.000		
28	MAN ANT	NONE	ORG	TOSS		1.000		
29	VEN ANT	NONE	ORG	TOSS		1.000		
30	BAT CASE	NONE	ORG	TOSS		1.000		

SPECIAL TEST EQUIPMENT/REPAIRMAN REQUIREMENTS

PECULIAR EQUIPMENT/REPAIRMAN

EQUIP NUM	EQUIPMENT NAME	ECHELON	REQUIREMENT PER SHOP	QUANTITY PER SHOP	TOT QTY AT ECH	HARDWR CST (TOTAL PV)	DEVELOPMENT COST	ACCUMULATING QTY OF THIS EQUIPMENT UP ECHELONS
2	BREAK BOX	DSU	.363	1	100	48976.	0.	100
3	STATIC PAD	DSU	.363	1	100	10799.	0.	100
5	ICD1	GSU	.212	1	24	28388.	0.	24
6	ICD 2	GSU	.094	1	24	24863.	0.	24
7	ICD 3	GSU	.022	1	24	59873.	0.	24
8	ICD 4	GSU	.009	1	24	7727.	0.	24
9	ICD 5	GSU	.115	1	24	156352.	0.	24
11	ICD 6	GSU	.495	1	24	22466.	0.	24
11	ICD 6	DEP	3.058	4	4	3744.	0.	28
12	ICD 7	GSU	.303	1	24	34217.	0.	24
13	ICD 8	GSU	.461	1	24	5029.	0.	24
13	ICD 8	DEP	1.346	2	2	419.	0.	26
14	ICD 9	GSU	.113	1	24	14418.	0.	24
15	ICD 10	GSU	.053	1	24	14418.	0.	24
16	ICD 11	GSU	.089	1	24	14418.	0.	24
17	ICD 12	GSU	.018	1	24	14418.	0.	24
18	ICD 13	GSU	.013	1	24	14418.	0.	24
21	ICD 14	GSU	.079	1	24	19975.	0.	24
22	ICD 15	GSU	.053	1	24	18330.	0.	24

TOTAL PRESENT VALUE OF PECULIAR SPECIAL TEST EQUIPMENT/REPAIRMEN(INC. DEVPMT COST) = 513249.

SPECIAL TEST EQUIPMENT/REPAIRMEN COMMON AT HIGHER ECHELONS

EQUIP NUM	EQUIPMENT NAME	ECHELON	REQUIREMENT PER SHOP	QUANTITY PER SHOP	TOT QTY AT ECH	HARDWR CST (TOTAL PV)	DEVELOPMENT COST	ACCUMULATING QTY OF THIS EQUIPMENT UP ECHELONS
1	COMMON EQ	DSU	.363	.363	36.32	4011461.	0.	36.32
4	REPAIR VAN	GSU	1.537	1.537	36.88	76951530.	0.	36.88
4	REPAIR VAN	DEP	3.058	3.058	3.06	6380626.	0.	39.94
10	TACFIREICD	GSU	.797	.797	19.14	56221.	0.	19.14
10	TACFIRFICD	DEP	3.058	3.058	3.06	8984.	0.	22.20
19	USM-410	GSU	1.083	1.083	26.00	37408325.	0.	26.00
19	USM-410	DEP	3.058	3.058	3.06	4400432.	0.	29.06
20	USM-465	GSU	.454	.454	10.88	783085.	0.	10.88

TOTAL PRESENT VALUE OF EQUIPMENT/REPAIRMEN WHERE COMMON = 130000664.

TOTAL PRESENT VALUE OF SPECIAL TEST EQUIPMENT/REPAIRMEN REQUIRED = 130513913.

LOGISTICS COSTS
LOGISTICS COSTS FOR COMPONENTS (PRESENT VALUE).

COMP NUM	COMPONENT NAME	INITIAL SPARES($)	CONSUMP. SPARES($)	LABOR COST	TPS COST	OTHER COST	TOTAL COST
1	RT	24,581,043.	49,447,850.	9,020,781.	0.	9,432,646.	92,482,320.
2	PWER AMP	2,461,536.	466,412.	1,225,435.	0.	2,440,433.	6,593,817.
3	FCCM	4,708,900.	4,457,652.	2,610,270.	0.	3,789,008.	15,565,830.
4	VEH MOUNT	2,161,880.	2,937,517.	1,411,637.	0.	3,194,267.	9,705,301.
5	IVRCU	557,760.	269,715.	302,430.	0.	1,252,888.	2,382,793.
6	MAN ANT	1,393,384.	6,599,563.	0.	0.	2,168,359.	10,161,306.
7	VEH ANT	10,892,448.	52,631,369.	0.	0.	9,413,089.	72,936,906.
8	HAT CASE	1,707,060.	7,988,945.	0.	0.	2,291,877.	11,987,882.
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COMPONENT COLUMN TOTALS:		48,464,011.	124,799,023.	14,570,553.	0.	33,982,567.	221,816,155.

LOGISTICS COSTS FOR MODULES (PRESENT VALUE).

MOD NUM	MODULE NAME	INITIAL SPARES($)	CONSUMP. SPARES($)	LABOR COST	TPS COST	PARTS COST	OTHER COST	TOTAL COST
1	CHASIS	6,031,929.	6,378,573.	2,300,974.	0.	6,121,063.	2,303,160.	23,135,699.
2	CONTROL	849,186.	869,347.	1,156,722.	0.	2,319,278.	1,057,814.	6,252,347.
3	PWR ASSY	460,560.	463,845.	1,240,846.	0.	2,344,093.	551,906.	5,061,250.
4	TUNER/MIX	1,818,310.	1,930,274.	2,490,129.	0.	4,840,119.	900,523.	11,979,355.
5	IF DEMOD	1,156,339.	1,206,945.	1,708,803.	0.	3,306,312.	715,272.	8,093,672.
6	EXCITER	4,963,960.	5,211,706.	2,745,059.	0.	3,237,489.	1,748,285.	17,906,499.
7	SYNTHESIS	2,081,160.	2,182,927.	2,054,682.	0.	4,604,755.	1,029,319.	11,952,843.
8	TWO-WIRE	1,010,097.	478,724.	1,422,947.	0.	1,948,132.	738,632.	5,598,533.
9	SW ASSY	1,926,876.	2,005,020.	2,510,104.	0.	4,234,740.	1,176,549.	11,853,289.
10	REMOTE I/O	355,266.	347,002.	725,813.	0.	1,122,582.	788,409.	3,339,072.
11	CON MATCH	859,325.	407,067.	1,118,389.	0.	1,539,443.	709,113.	4,633,337.
12	AUD PS	422,808.	434,542.	990,435.	0.	1,634,978.	503,271.	3,986,033.
13	AUD I/O	1,108,119.	1,153,915.	2,164,232.	0.	3,212,283.	690,797.	8,329,346.
14	AUD CON	553,608.	571,521.	1,467,122.	0.	2,188,922.	633,899.	5,415,062.
15	CHAS FILT	291,494.	708,985.	547,659.	0.	1,271,086.	187,292.	3,006,516.
16	AMP BD	91,575.	228,706.	349,086.	0.	718,435.	114,647.	1,502,450.
17	DECODER	37,296.	88,389.	267,418.	0.	379,359.	82,523.	854,985.
18	ONE-WATT	2,077,744.	2,191,732.	2,245,975.	0.	3,933,144.	1,026,287.	11,474,882.
19	PWR SUPP	850,164.	850,045.	1,064,179.	0.	2,494,203.	658,190.	5,916,781.
20	PA CHASIS	845,018.	826,495.	446,476.	0.	960,824.	871,607.	3,950,371.
21	ANALOG	282,744.	1,281,848.	0.	0.	0.	390,416.	1,955,008.
22	IVRCU PS	112,567.	524,948.	0.	0.	0.	286,292.	923,807.
23	DECOD/TIM	115,440.	522,791.	0.	0.	0.	252,699.	890,930.
24	MICRO	56,610.	57,052.	156,746.	0.	320,159.	472,976.	1,063,544.
25	IVRCU CHAS	182,646.	148,384.	180,863.	0.	384,188.	440,722.	1,336,802.
26	MTG TRAT	12,330.	57,317.	3,980.	0.	39,770.	52,925.	166,322.
27	ECCM PTS	517,000.	2,439,383.	0.	0.	0.	3,204,180.	6,160,563.
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MODULE COLUMN TOTALS:		29,070,171.	33,567,483.	29,358,589.	0.	53,155,357.	21,587,695.	166,739,298.

MTD & RTD & TURN AROUND TIME

COMPONENT NUMBER	COMPONENT NAME	WASH	MTD				RTD				TAT(INC SRU WAIT)			
			ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP
1	RT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	8.0	30.0	120.0
2	PWER AMP	.010	.000	.000	.990	.000	1.000	.000	.000	.000	1.0	3.0	45.1	120.0
3	ECCM	.050	.000	.000	.950	.000	1.000	.000	.000	.000	1.0	3.0	35.2	120.0
4	VEH MOUNT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	12.1	30.0	120.0
5	IVRCU	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	19.5	30.0	120.0
6	MAN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
7	VEN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
8	BAT CASE	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0

MTD & RTD & TURN AROUND TIME

MODULE NUMBER	MODULE NAME	WASH	MTD ORG	MTD DSU	MTD GSU	MTD DEP	RTD ORG	RTD DSU	RTD GSU	RTD DEP	TAT INC WAIT ORG	TAT INC WAIT DSU	TAT INC WAIT GSU	TAT INC WAIT DEP
1	CHASIS	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.3	120.0
2	CONTROL	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.4	120.0
3	PWR ASSY	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.6	120.0
4	TUNER/MIX	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.5	120.0
5	IF DEMOD	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.5	120.0
6	EXCITER	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	31.8	120.0
7	SYNTHESIS	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.7	120.0
8	TWO-WIRE	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	120.6
9	SW ASSY	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.7	120.0
10	REMOTE I/O	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.4	120.0
11	CON MATCH	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	120.8
12	AUD PS	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.9	120.0
13	AUD I/O	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.4	120.0
14	AUD CON	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.7	120.0
15	CHAS FILT	.050	.000	.000	.950	.000	.000	.000	1.000	.000	1.0	3.0	30.4	120.0
16	AMP BD	.050	.000	.000	.950	.000	.000	.000	1.000	.000	1.0	3.0	73.1	120.0
17	DECODER	.050	.000	.000	.950	.000	.000	.000	1.000	.000	1.0	3.0	31.0	120.0
18	ONE-WATT	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	30.5	120.0
19	PWR SUPP	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	31.3	120.0
20	PA CHASIS	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	76.5	120.0
21	ANALOG	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
22	IVRCU PS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
23	DECOD/TIM	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
24	MICRO	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	31.2	120.0
25	IVRCU CHAS	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	76.8	120.0
26	MTG TRAT	.250	.000	.750	.000	.000	.000	1.000	.000	.000	1.0	118.8	30.0	120.0
27	ECCM PTS	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	.0	.0	.0	.0

SESAME OUTPUT FOR COMPONENTS

SPARES

NUMBER	COMPONENT NAME	ALLOWANCES PER CLAIMANT ORG	DSU	GSU	DEPOT	QTY * UP	FAIL PER END ITEM PER YR
1	RT	2.	19.	6.	1717.	24,581,043.	.600
2	PWER AMP	1.	7.	48.	90.	2,461,536.	.029
3	ECCM	1.	15.	104.	929.	4,708,900.	.064
4	VEH MOUNT	1.	3.	1.	279.	2,161,880.	.094
5	IVRCU	1.	1.	0.	64.	557,760.	.020
6	MAN ANT	1.	13.	51.	15310.	1,393,384.	.054
7	VEN ANT	1.	22.	90.	27558.	3,630,816.	.098
8	HAT CASE	1.	11.	41.	12260.	1,707,060.	.044

SESAME OUTPUT FOR MODULES

SPARES

NUMBER	MODULE NAME	ALLOWANCES PER CLAIM. ORG	DSU	GSU	DEPOT	QTY * UP	FAIL PER END ITEM PER YR
1	CHASIS	0.	13.	90.	821.	6,031,929.	.057
2	CONTROL	0.	7.	46.	419.	849,186.	.029
3	PWR ASSY	0.	8.	49.	448.	460,560.	.031
4	TUNER/MIX	0.	14.	97.	887.	1,818,310.	.061
5	IF DEMOD	0.	10.	67.	613.	1,156,339.	.042
6	EXCITER	0.	16.	107.	976.	4,963,960.	.068
7	SYNTHESIS	0.	12.	80.	734.	2,081,160.	.051
8	TWO-WIRE	0.	9.	33.	4215.	1,010,097.	.035
9	SW ASSY	0.	15.	98.	894.	1,926,876.	.062
10	REMOTE I/O	0.	5.	29.	266.	355,266.	.018
11	CON MATCH	0.	7.	26.	3321.	859,325.	.028
12	AUD PS	0.	6.	39.	360.	422,808.	.024
13	AUD I/O	0.	13.	84.	773.	1,108,119.	.053
14	AUD CON	0.	9.	57.	528.	553,608.	.036
15	CHAS FILT	0.	0.	10.	203.	291,494.	.014
16	AMP BD	0.	0.	6.	131.	91,575.	.009
17	DECODER	0.	0.	5.	102.	37,296.	.007
18	ONE-WATT	0.	13.	87.	801.	2,077,744.	.055
19	PWR SUPP	0.	7.	42.	386.	850,164.	.026
20	PA CHASIS	0.	3.	18.	166.	845,018.	.011
21	ANALOG	0.	2.	6.	1504.	282,744.	.005
22	IVRCU PS	0.	1.	4.	1041.	112,567.	.004
23	DECOD/TIM	0.	1.	3.	790.	115,440.	.003
24	MICRO	0.	1.	6.	62.	56,610.	.004
25	IVRCU CHAS	0.	2.	7.	70.	182,646.	.004
26	MTG TRAT	0.	0.	0.	30.	12,330.	.000
27	ECCM PTS	0.	0.	2.	328.	9,400.	.001

LOGISTICS TOTALS

INITIAL SPARES COST	83,843,117.
CONSUMPTION SPARES (PRESENT VALUE)	185,806,462.
INVENTORY HOLDING COST (PRESENT VALUE)	20,088,099.
TRANSPORTATION COST (PRESENT VALUE)	5,522,589.
REQUISITION COST (PRESENT VALUE)	35,328,795.
CATALOGING COST (PRESENT VALUE)	953,603.
BIN COST (PRESENT VALUE)	9,139,244.
REPAIR COST (PRESENT VALUE)	43,929,143.
SCREENING COST	0.
DOCUMENTATION COST	3,944,400.
TEST PROGRAM SETS COST	0.
TOTAL LOGISTICS COST	388,555,451.

TOTAL COST FOR THIS MAINTENANCE CONCEPT IN TERMS OF PRESENT VALUE

TOTAL LOGISTICS COST	388,555,451.
TOTAL TEST EQUIPMENT/REPAIRMAN COST	130,513,913.
TOTAL	519,069,364.

OPERATIONAL AVAILABILITY ACHIEVED	AND	CURVE PARAM USED
.9951		.0

POLICY FILE

123	1	1.0000
123	2	1.0000
123	3	1.0000
123	4	1.0000
123	5	1.0000
123	6	1.0000
123	7	1.0000
124	8	1.0000
123	9	1.0000
123	10	1.0000
124	11	1.0000
123	12	1.0000
123	13	1.0000
123	14	1.0000
133	15	1.0000
133	16	1.0000
133	17	1.0000
135	18	1.0000
123	19	1.0000
123	20	1.0000
123	21	1.0000
125	22	1.0000
125	23	1.0000
125	24	1.0000
123	25	1.0000
123	26	1.0000
122	27	1.0000
155	28	1.0000
155	29	1.0000
155	30	1.0000

OTHER COST BREAKOUT

OTHER LOGISTICS COSTS FOR COMPONENTS (PRESENT VALUE).

COMP NUM	COMPONENT NAME	HOLDING	TRANSP.	REQ	BIN	CATLOG	DOCUM.
1	RT	5,889,409.	1,788,800.	1,421,942.	313,899.	1,796.	16,800.
2	PWER AMP	589,763.	152,546.	1,339,229.	313,899.	1,796.	43,200.
3	ECCM	1,128,212.	30,507.	1,422,092.	313,899.	1,796.	892,500.
4	VEH MOUNT	517,968.	1,133,027.	1,210,777.	313,899.	1,796.	16,800.
5	TVRCU	133,635.	19,990.	778,821.	301,846.	1,796.	16,800.
6	MAN ANT	333,843.	96,728.	1,422,092.	313,899.	1,796.	0.
7	VEN ANT	2,609,738.	1,589,988.	4,266,277.	941,698.	5,388.	0.
8	BAT CASE	408,997.	145,092.	1,422,092.	313,899.	1,796.	0.
COMPONENT COLUMN TOTALS:		11,611,565.	4,956,678.	13,283,322.	3,126,938.	17,950.	986,100.

OTHER LOGISTICS COSTS FOR MODULES (PRESENT VALUE).

MOD NUM	MODULE NAME	HOLDING	TRANSP.	REQ	HIN	CATLOG	DOCUM.
1	CHASIS	1,445,199.	104,687.	282,595.	62,780.	174,199.	233,700.
2	CONTROL	203,458.	4,421.	282,017.	62,780.	26,938.	478,200.
3	PWR ASSY	110,346.	4,742.	282,595.	62,780.	25,142.	66,300.
4	TUNER/MIX	435,652.	9,517.	282,595.	62,780.	52,080.	57,300.
5	IF DEMOD	277,049.	6,531.	282,595.	62,780.	35,917.	50,400.
6	EXCITER	1,189,323.	10,491.	282,595.	62,780.	1,796.	201,300.
7	SYNTHESIS	498,628.	7,852.	282,595.	62,780.	59,263.	118,200.
8	TWO-WIRE	242,011.	61,613.	282,595.	62,780.	28,734.	60,900.
9	SW ASSY	451,663.	9,593.	282,595.	62,780.	35,917.	324,000.
10	REMOTE I/O	85,119.	2,774.	261,857.	62,780.	8,979.	366,900.
11	CON MATCH	205,887.	48,426.	282,595.	62,780.	32,326.	77,100.
12	AUD PS	101,301.	3,785.	274,238.	62,780.	14,367.	46,800.
13	AUD I/O	265,496.	8,271.	282,595.	62,780.	19,754.	51,900.
14	AUD CON	132,640.	5,607.	282,595.	62,780.	14,367.	135,900.
15	CHAS FILT	69,839.	7,920.	25,623.	12,556.	19,754.	51,600.
16	AMP BD	21,941.	1,472.	16,332.	12,556.	23,346.	39,000.
17	DECODER	8,936.	1,128.	12,511.	12,556.	3,592.	43,800.
18	ONE-WATT	497,810.	102,185.	282,595.	62,780.	35,917.	45,000.
19	PWR SUPP	203,692.	14,525.	277,688.	62,780.	41,305.	58,200.
20	PA CHASIS	202,459.	105,617.	248,786.	62,780.	145,465.	106,500.
21	ANALOG	67,743.	4,171.	253,927.	62,780.	1,796.	0.
22	IVRCU PS	26,970.	2,872.	191,875.	62,780.	1,796.	0.
23	DECOD/TIM	27,658.	2,169.	158,296.	62,780.	1,796.	0.
24	MICRO	13,563.	542.	154,003.	62,780.	5,388.	236,700.
25	IVRCU CHAS	43,760.	3,291.	177,697.	62,780.	46,692.	106,500.
26	MTG TRAT	2,954.	1,827.	6,633.	502.	39,509.	1,500.
27	ECCM PTS	123,869.	29,882.	2,320,341.	690,579.	39,509.	0.
MODULE COLUMN TOTALS:		6,964,966.	565,911.	8,052,964.	2,109,909.	935,644.	2,958,300.

LOGISTICS COSTS FOR PARTS (PRESENT VALUE).
(PARTS CATALOGING COSTS ARE INCLUDED IN MODULE CATALOGING COSTS)

USED ON MOD. NUM	USED ON MOD. NAME	INITIAL PARTS($)	CONSUMP. PARTS($)	HOLD COST	REQ COST	BIN COST
1	CHASIS	580,800.	2,150,335.	139,155.	2,045,399.	1,205,374.
2	CONTROL	239,400.	1,080,994.	57,358.	765,742.	175,784.
3	PWR ASSY	250,250.	1,159,611.	59,958.	711,046.	163,228.
4	TUNER/MIX	508,200.	2,327,107.	121,760.	1,531,484.	351,567.
5	IF DEMOD	348,175.	1,596,933.	83,420.	1,039,221.	238,564.
6	EXCITER	487,975.	2,565,348.	116,915.	54,696.	12,556.
7	SYNTHESIS	429,600.	1,920,167.	102,929.	1,750,268.	401,791.
8	TWO-WIRE	492,750.	1,329,790.	118,059.	0.	7,534.
9	SW ASSY	493,050.	2,345,775.	118,131.	1,039,221.	238,564.
10	REMOTE I/O	141,400.	678,296.	33,878.	218,783.	50,224.
11	CON MATCH	391,850.	1,045,171.	93,884.	0.	8,538.
12	AUD PS	192,500.	925,594.	46,121.	382,871.	87,892.
13	AUD I/O	417,250.	2,022,545.	99,970.	546,959.	125,560.
14	AUD CON	280,000.	1,371,074.	67,086.	382,871.	87,892.
15	CHAS FILT	118,500.	511,805.	28,392.	486,829.	125,560.
16	AMP BD	61,200.	326,233.	14,663.	310,312.	6,027.
17	DECODER	50,175.	249,911.	12,022.	54,696.	12,556.
18	ONE-WATT	448,875.	2,098,937.	107,547.	1,039,221.	238,564.
19	PWR SUPP	223,850.	994,511.	53,633.	945,978.	276,231.
20	PA CHASIS	86,000.	417,200.	20,605.	396,841.	40,179.
24	MICRO	31,600.	146,485.	7,571.	109,392.	25,112.
25	IVRCU CHAS	33,750.	169,022.	8,086.	160,774.	12,556.
26	MTG TRAT	1,785.	7,112.	428.	19,898.	10,547.
PART COLUMN TOTALS:		6,308,935.	27,439,956.	1,511,567.	13,992,503.	3,902,398.

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AVAIL & CURVE PAR    .9977        1000.
AVAIL & CURVE PAR    .9950          10.
AVAIL & CURVE PAR    .9951           0.
AVAIL & CURVE PAR    .9951           0.
AVAIL & CURVE PAR    .9951           0.
AVAIL & CURVE PAR    .0000           0.
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AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVE WAIT(DAYS) FOR SRU BY ECHELON        .00      5.89      8.33       .00
AVERAGE DOWN TIME (IN DAYS) DUE TO CTDEL IS:     .00
AVE REPAIR COST BY ECHELON         .001344642.173837654.33 318208.57

 TO OBTAIN AVG PRODUCTIVE REPAIR HRS AT
ECHELON K, DIVIDE BY EFFECTIVE LABOR RATE AT K
(SEE PREPROCESSOR)
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STOCKAGE LISTS

ORGANIZATION UNIT STOCKAGE LIST

NUM	NAME	TYPE/ESS.		QUANTITY	$ VALUE
1	RT	C	1	2.	10.326.
2	PWER AMP	C	1	1.	1.008.
3	ECCM	C	1	1.	868.
4	VEH MOUNT	C	1	1.	1.960.
5	IVRCU	C	1	1.	840.
6	MAN ANT	C	1	1.	76.
7	VEN ANT	C	1	1.	112.
8	BAT CASE	C	1	1.	115.

TOTAL DOLLAR VALUE OF LIST IS: 15.305.

DIRECT SUPPORT UNIT STOCKAGE LIST

NUM	NAME	TYPE/ESS.		QUANTITY	$ VALUE
1	RT	C	1	19.	98,097.
2	PWER AMP	C	1	7.	7,056.
3	ECCM	C	1	15.	13,020.
4	VEH MOUNT	C	1	3.	5,880.
5	IVRCU	C	1	1.	840.
6	MAN ANT	C	1	13.	988.
7	VEN ANT	C	1	22.	2,464.
8	BAT CASE	C	1	11.	1,265.
1	CHASIS	M	1	13.	18,317.
2	CONTROL	M	1	7.	2,674.
3	PWR ASSY	M	1	8.	1,520.
4	TUNER/MIX	M	1	14.	5,516.
5	IF DEMOD	M	1	10.	3,590.
6	EXCITER	M	1	16.	15,440.
7	SYNTHESIS	M	1	12.	6,480.
8	TWO-WIRE	M	1	9.	1,539.
9	SW ASSY	M	1	15.	6,090.
10	REMOTE I/O	M	1	5.	1,215.
11	CON MATCH	M	1	7.	1,295.
12	AUD PS	M	1	6.	1,338.
13	AUD I/O	M	1	13.	3,523.
14	AUD CON	M	1	9.	1,782.
18	ONE-WATT	M	1	13.	6,448.
19	PWR SUPP	M	1	7.	2,842.
20	PA CHASIS	M	1	3.	2,823.
21	ANALOG	M	1	2.	306.
22	IVRCU PS	M	1	1.	91.
23	DECOD/TIM	M	1	1.	120.
24	MICRO	M	1	1.	185.
25	IVRCU CHAS	M	1	2.	834.

TOTAL DOLLAR VALUE OF LIST IS: 213,578.

APPENDIX F

SAMPLE SCREENING RUN

Sample input and output files from a screening run are contained in this appendix. While the data was derived from a real system, some of it has been modified to demonstrate certain features of the OSAMM. Thus, no data from this appendix should be used in any other analysis. Furthermore, the data in this appendix should not be compared to that in any of the other sample runs in this manual.

INPUT FILE

```
SINCGARS V        8325  15      730     0700     25 360 1     50    1
  1   3  30 120 0 0    1    1  15  60  80 0 0
6V  500 100  24  2200    2  40   40 510 760    15   30   30
 706105917251725 6868                                              01177  00034  00035
          65340  16247  22016    3532      03    2378  300
 1 COMMON EQ                 15 1 2
  34990  1768
02 USM-410                     2 3
                                             1724000101500       1145000101500
03 USM-465                     2 3
                                               71000101500
04 REP VAN                     2 3 1
                                              193750101500          30000101500
05 MARATHONCP                  4 3
 271000101500
06 MARATHONST                  4 3
 478600101500
07 AC STATION                  4 4
  54000101500
09 IF STATION                  4 4
  87000101500
10 TUNER STA                   4 4
 114000101500
11 SYN STA                     4 4
 112000101500
12 EXCIT STA                   4 4
 118000101500
13 PA STA                      4 4
  30000101500
15 SWITCH STA                  4 4
  54000101500
16 AUDIO I/O                   4 4
  62000101500
17 AUD CON STA                 4 4
  62000101500
18 AUD PS STA                  4 4
  58000101500
19 TWO WIRE S                  4 4
  47000101500
22 ONE WAT STA                 4 4
  44000101500
23 VEH PS STA                  4 4
  43000101500
25 PA CHA STA                  4 4
  45000101500
26 AMP RD STA                  4 4
  45000101500
27 SCREENER              500   4 1
    120  1800
28 SCREEN PA             700   4 1
    130  1500
99
99
1000RT           5163  10501    1              1
ALT1    5          56             01
2000PWER AMP     1008   9501    1              1           1
ATE    15     5           432000  4   1   2   5
    1      3000000            28     1
3000ECCM          868    751   050             1           1
ATE    15     5          8930000  4   1   3   5
     200     400000            27   2
5000VEH MOUNT    1960  42501    1              1
ALT1    5          56             01
6000IVRCU         840   3501    1              1
ALT1    5          56             01
```

```
9999
7000MAN ANT         76    8 1      1     1       14752
8000VEN ANT        112   2431      3     3        2726
9000BAT CASE       115   15 1      1     1       18440
9999
1001CHASIS        1409   5  1      5                    1   25      961
ALT1    15     5            2337000   4   1    3    5
     200     400000                  27   2
1002CONTROL        382    421      5                    1   25      141
ATE     15     5            4782000   4   1    3    5
     200     400000                  27   2
1003PWR ASSY       190    421      5                    1   25      131
STE     125    25            510000   4   1   13   25
     200     400000                  27   2
1004TUNER/MIX      394    421      5                    1   25      281
STE     125    25            525000   4   1   10   25
     200     400000                  27   2
1005IF DEMOD       359    421      5                    1   25      191
STE     125    25            540000   4   1    9   25
     200     400000                  27   2
1006EXCITER        965    421      5                    1   25      801
STE     125    25            870000   4   1   12   25
     200     400000                  27   2
1007SYNTHESIS      540    421      5                    1   25      321
STE     125    25            630000   4   1   11   25
     200     400000                  27   2
1008TWO-WIRE       171    421      5                    1   25      151
STE     125    25            475000   4   1   19   25
     200     400000                  27   2
1009SW ASSY        406    421      5                    1   25      191
STE     125    25            690000   4   1   15   25
     200     400000                  27   2
1010REMOTE I/O     243    421      5                    1   25       41
ATE     15     5            3669000   4   1    3    5
     200     400000                  27   2
1011CON MATCH      185    421      5                    1   25      171
STE     125    25            510000   4   1    7   25
     200     400000                  27   2
1012AUD PS         223    421      5                    1   25       71
STE     125    25            630000   4   1   18   25
      1      600000                  28       1
1013AUD I/O        271    421      5                    1   25      101
STE     125    25            450000   4   1   16   25
     200     400000                  27   2
1014AUD CON        198    421      5                    1   25       71
STE     125    25            600000   4   1   17   25
     200     400000                  27   2
2001CHAS FILT      658   6  1      5                    1   25      101
STE     125    25            450000   4   1   25   25
     200     400000                  27   2
2002AMP BD         333   1751      5                    1   25      121
STE     125    25            450000   4   1   26   25
      1      400000                  28       1
2003DECODER        168   1751      5                    1   25        1
ATE     15     5             438000   4   1    2    5
5001ONE-WATT       496   5  1      5                    1   25      191
STE     125    25            585000   4   1   22   25
     200     400000                  27   2
5002PWR SUPP       406   15 1      5                    1   25       22
STE     125    25            474000   4   1   23   25
5003PA CHASIS      941  26  1      5                    1   25       80
ATE     15     5            1065000   4   1    3    5
6001ANALOG         153    381      5                    1   25        5
ATE     15     5             495000   4   1    2    5
6002IVRCU PS        91    381      5                    1   25       81
ATE     15     5             492000   4   1    2    5
```

```
    200     400000                 27   2
6003DECOD/TIM      120     381     5                  1   25      2
ATE     15     5             1578000   4   1    3    5
6004MICRO          185     381     5                  1   25      2
ATE     15     5             2367000   4   1    3    5
6005IVRCU CHAS     417   2   1     5                  1   25     25
ATE     15     5             1065000   4   1    3    5
5004MTG THAT       411   10  1     25                 1   17     21
ALTI     5              5
9999
3001ECCM PTS        25     251    55    22
9999
10001001      14007
10001002      27863
10001003      25974
10001004      12943
10001005      18861
10001006      11741
10001007      15686
10001008      22650
10001009      12840
10001010      44405
10001011      28818
10001012      32541
10001013      14892
10001014      21968
20002001      58850
20002002      92326
20002003     120522
30003001      12472
50005001      14350
50005002      30286
50005003      72195
60006001     151371
60006002     219843
60006003     291099
60006004     205617
60006005     178200
50005004    2273457
9999
```

MAIN OUTPUT FILE

VERSION DATE 87/07/28

RUN DATE 87/09/02.

THIS IS A SCREENING RUN

REPAIR END ITEM	LOWEST ECHELON TO REPAIR COMPONENTS	REPAIR MODULES
ORG	ORG	ORG

LOWEST ECHELON TO SCREEN COMPONENTS	SCREEN MODULES
DSU	DSU

END ITEM INFORMATION

END ITEM	PRICE	LIFE (YEARS)	OPERATING HOURS	MTBF (HOURS)	MTR (HOURS)	AVAILABILITY TARGET	UNSERVICEABLE RETURN RATE	FALSE REMOVAL DEFAULT
SINCGARS V	8325.	15	730.	700.	.25	.960	1.00	.50

TAT DEFAULTS (USED ONLY IF TAT IS NOT INPUT WITH EACH COMPONENT OR MODULE)

ORG	DSU	GSU	DEP
1.	3.	30.	120.

TAT DEFAULTS FOR SCREENING 1. 1. 15. 60.

DETECTION FRACTION DEFAULT .80

THERE ARE NO TEST EQUIPMENTS OR SPECIAL REPAIRMEN NEEDED TO REPAIR THE END ITEM

DEPLOYMENT INFORMATION

RSC	IVSYS	CLAIMANTS ORG	CLAIMANTS DSU	CLAIMANTS GSU	DENSITY	OST ORG-DSU	OST DSU-GSU	OST GSU-DEP	PLT	CONTACT DELAY	OPERATING LEVEL ORG	OPERATING LEVEL DSU	OPERATING LEVEL GSU
6	V	500.	100.	24.	2200.	2.0	40.0	40.0	510.0	760.0	15.0	30.0	30.0

AVERAGE OUPS

4.4	22.0	91.7

DISTANCE (MILES) BETWEEN

ORG-DSU	DSU-GSU	GSU-DEPOT
7.	250.	3500.

COST PARAMETERS

LABOR RATES

	ORG	DSU	GSU	DEPOT
BASE	7.06	10.59	17.25	17.25
LOADED	11.86	17.79	25.01	25.01
PROD FAC	.85	.85	.85	.85
EFFECTIVE	13.95	20.93	29.43	29.43

TRANSPORTATION COST

	ORG-DSU	DSU-GSU	GSU-DEPOT
PER LB-MI	.01177	.00034	.00035
PER POUND	.08	.09	1.23

OTHER COSTS

INITIAL CATALOG	RECURRING CATALOG	INITIAL BIN	RECURRING BIN	HOLDING FRACTION	COST PER REQUISITION	COST PER PAGE OF TECH DOC
653.40	162.47	220.16	35.32	.03	23.78	300.00

COST PARAMETERS IN TERMS OF PRESENT VALUE
(PVF = 7.98638835)

LABOR RATE (PRESENT VALUE)

ORG	DSU	GSU	DEPOT
111.44	167.16	235.01	235.01

TRANSPORTATION COST (PRESENT VALUE)

ORG-DSU	DSU-GSU	GSU-DEP
.66	.68	9.78

COSNSN	COSBIN	COSREQ
1795.86	502.24	189.92

EQUIPMENT NUMBER 1

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
COMMON EQ	0.	15	ORG	DSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DSU	34990.	.27	0.	1768.	110440.
GSU	34990.	.27	0.	1768.	110440.
DEP	34990.	.27	0.	1768.	110440.

EQUIPMENT NUMBER 2

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
USM-410	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	1724000.	.10	0.	1500.	3100853.
DEP	1145000.	.10	0.	1500.	2059441.

EQUIPMENT NUMBER 3

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
USM-465	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	71000.	.10	0.	1500.	127703.
DEP	71000.	.10	0.	1500.	127703.

EQUIPMENT NUMBER 4

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
REP VAN	0.	15	DSU	GSU	YES

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	193750.	.10	0.	1500.	348486.
DEP	30000.	.10	0.	1500.	53959.

EQUIPMENT NUMBER 5

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
MARATHONCP	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON UNIT COST MAINTENANCE INSTALLATION AVAILABLE

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	271000.	.10	0.	1500.	487431.
DEP	271000.	.10	0.	1500.	487431.

EQUIPMENT NUMBER 6

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
MARATHONST	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	478600.	.10	0.	1500.	860828.
DEP	478600.	.10	0.	1500.	860828.

EQUIPMENT NUMBER 7

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AC STATION	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	54000.	.10	0.	1500.	97126.

EQUIPMENT NUMBER 9

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
IF STATION	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	87000.	.10	0.	1500.	156482.

EQUIPMENT NUMBER 10

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
TUNER STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	114000.	.10	0.	1500.	205045.

EQUIPMENT NUMBER 11

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
SYN STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	112000.	.10	0.	1500.	201447.

EQUIPMENT NUMBER 12

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
EXCIT STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	118000.	.10	0.	1500.	212239.

EQUIPMENT NUMBER 13

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
PA STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	30000.	.10	0.	1500.	53959.

EQUIPMENT NUMBER 15

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
SWITCH STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	54000.	.10	0.	1500.	97126.

EQUIPMENT NUMBER 16

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AUDIO I/O	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	62000.	.10	0.	1500.	111516.

EQUIPMENT NUMBER 17

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AUD CON ST	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	62000.	.10	0.	1500.	111516.

EQUIPMENT NUMBER 18

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AUD PS STA	0.	15	DEP	DEP	NO

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	58000.	.10	0.	1500.	104321.

EQUIPMENT NUMBER 19

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
TWO WIRE S	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	47000.	.10	0.	1500.	84536.

EQUIPMENT NUMBER 22

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ONE WAT ST	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	44000.	.10	0.	1500.	79140.

EQUIPMENT NUMBER 23

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
VEH PS STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	43000.	.10	0.	1500.	77341.

EQUIPMENT NUMBER 25

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
PA CHA STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	45000.	.10	0.	1500.	80939.

EQUIPMENT NUMBER 26

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AMP HD STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	45000.	.10	0.	1500.	80939.

EQUIPMENT NUMBER 27

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
SCREENER	500.	15	DEP	ORG	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
ORG	120.	.27	0.	1800.	379.
DSU	120.	.27	0.	1800.	379.
GSU	120.	.27	0.	1800.	379.
DEP	120.	.27	0.	1800.	379.

EQUIPMENT NUMBER 28

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
SCREEN PA	700.	15	DEP	ORG	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
ORG	130.	.27	0.	1500.	410.
DSU	130.	.27	0.	1500.	410.
GSU	130.	.27	0.	1500.	410.
DEP	130.	.27	0.	1500.	410.

```
COMPONENT INFORMATION

REF COMP COMP   COMPONENT      UNIT    WEIGHT   ESS  HAS   WASH    FALSE              TAT            NUM
NUM NUM   ID       NAME        PRICE                 NSN           REMOVAL     ORG  DSU  GSU  DEP    ALT
  1   1  1000  RT               5163.    10.50    1   NO    .010     .50        1.   3.   30. 120.    1

        ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
          1     ALT1       .50     .00         56.             0.          .00           0.              1

                EQ/REP NUM     TIME USED
                    1              .50

REF COMP COMP   COMPONENT      UNIT    WEIGHT   ESS  HAS   WASH    FALSE              TAT            NUM
NUM NUM   ID       NAME        PRICE                 NSN           REMOVAL     ORG  DSU  GSU  DEP    ALT
  2   2  2000  PWER AMP         1008.     9.50    1   NO    .010     .50        1.   3.   30. 120.    1

        ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
          1     ATE       1.50     .50          0.         43200.          .00      43200.               2

                EQ/REP NUM     TIME USED
                    4             1.00
                    2              .50

  THIS ITEM IS A CANDIDATE FOR SCREENING

    SCRN TIME      SCREEN TAT           DETECTION FRACTION           END TO END TPS            NUMBER OF SCREENING EQUIP/REP
                                                                DEVEL      MAINT       PV
       .10        1.   1.  15.  60.              .80            30000.       .00      30000.                  1

    SCREENING EQ/REP NUM                TIME USED
          28                               .01

REF COMP COMP   COMPONENT      UNIT    WEIGHT   ESS  HAS   WASH    FALSE              TAT            NUM
NUM NUM   ID       NAME        PRICE                 NSN           REMOVAL     ORG  DSU  GSU  DEP    ALT
  3   3  3000  ECCM              868.      .75    1   NO    .050     .50        1.   3.   30. 120.    1

        ALT#    NAME    . MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
          1     ATE       1.50     .50          0.        893000.          .00     893000.               2

                EQ/REP NUM     TIME USED
                    4             1.00
                    3              .50

  THIS ITEM IS A CANDIDATE FOR SCREENING

    SCRN TIME      SCREEN TAT           DETECTION FRACTION           END TO END TPS            NUMBER OF SCREENING EQUIP/REP
                                                                DEVEL      MAINT       PV
       .20        1.   1.  15.  60.              .80            40000.       .00      40000.                  1

    SCREENING EQ/REP NUM                TIME USED
          27                               .20

REF COMP COMP   COMPONENT      UNIT    WEIGHT   ESS  HAS   WASH    FALSE              TAT            NUM
NUM NUM   ID       NAME        PRICE                 NSN           REMOVAL     ORG  DSU  GSU  DEP    ALT
  4   4  5000  VEH MOUNT        1960.    42.50    1   NO    .010     .50        1.   3.   30. 120.    1

        ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
          1     ALT1       .50     .00         56.             0.          .00           0.              1

                EQ/REP NUM     TIME USED
                    1              .50
```

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
5	5	6000	IVRCU	840.	3.50	1	NO	.010	.50	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	56.	0.	.00	0.	1

EQ/REP NUM	TIME USED
1	.50

PSEUDO COMPONENTS

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	AVERAGE PRICE	WEIGHT	ESS	FALSE REMOVAL	TOTAL PARTS	NEW PARTS	MTBF	FAILURES PER YEAR
6	6	7000	MAN ANT	76.	.80	1	.50	1	1	14752.	.495E-01
7	7	8000	VEN ANT	112.	2.43	1	.50	3	3	2725.	.268E+00
8	8	9000	HAT CASE	115.	1.50	1	.50	1	1	18440.	.396E-01

THERE ARE 8 COMPONENTS

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
9	1	1001	CHASIS	1409.	5.00	1	NO	.050	.50	1.	3.	30.	120.	1	96.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	1.50	.50	0.	233700.	.00	233700.	2

EQ/REP NUM	TIME USED
4	1.00
3	.50

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	END TO END TPS MAINT	END TO END TPS PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
10	2	1002	CONTROL	382.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	14.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	478200.	.00	478200.	2

EQ/REP NUM	TIME USED
4	1.00
3	.50

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	END TO END TPS MAINT	END TO END TPS PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
11	3	1003	PWR ASSY	190.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	13.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	STF	1.25	.25	0.	51000.	.00	51000.	2

EQ/REP NUM	TIME USED
4	1.00
13	.25

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	END TO END TPS MAINT	END TO END TPS PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
12	4	1004	TUNER/MIX	394.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	28.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	STE	1.25	.25	0.	52500.	.00	52500.	2

EQ/REP NUM	TIME USED
4	1.00
10	.25

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	END TO END TPS MAINT	END TO END TPS PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
13	5	1005	IF DEMOD	359.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	19.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	STE	1.25	.25	0.	54000.	.00	54000.	2

EQ/REP NUM	TIME USED
4	1.00
9	.25

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	END TO END TPS MAINT	END TO END TPS PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
14	6	1006	EXCITER	965.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	80.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	STE	1.25	.25	0.	87000.	.00	87000.	2

EQ/REP NUM	TIME USED
4	1.00
12	.25

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	END TO END TPS MAINT	END TO END TPS PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF MOD MOD MODULE UNIT WEIGHT ESS HAS WASH FALSE NUM NUM OF PARTS COST

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
15	7	1007	SYNTHESIS	540.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	12.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	STE	1.25	.25	0.	63000.	.00	63000.	2

EQ/REP NUM	TIME USED
4	1.00
11	.25

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	MAINT	PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
16	8	1008	TWO-WIRE	171.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	15.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	STE	1.25	.25	0.	47500.	.00	47500.	2

EQ/REP NUM	TIME USED
4	1.00
19	.25

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	MAINT	PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
17	9	1009	SW ASSY	406.	.42	1	NO	.050	.50	1.	3.	30.	120.	1	19.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	STE	1.25	.25	0.	69000.	.00	69000.	2

EQ/REP NUM	TIME USED
4	1.00
15	.25

THIS ITEM IS A CANDIDATE FOR SCREENING

SCRN TIME	SCREEN TAT	DETECTION FRACTION	END TO END TPS DEVEL	MAINT	PV	NUMBER OF SCREENING EQUIP/REP
.20	1. 1. 15. 60.	.80	40000.	.00	40000.	1

SCREENING EQ/REP NUM	TIME USED
27	.20

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
18	10	1010	REMOTE I/O	243.	.42	1	NO	.050	.50	1.	[illegible]	[illegible]	120.	1	4.	25.00

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ALT#  NAME   MTTR  DIAG TIME   PAGES      TPS DEV     TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
 1    ATE    1.50     .50        0.       366900.       .00       366900.              2

        EQ/REP NUM    TIME USED
             4           1.00
             3            .50

THIS ITEM IS A CANDIDATE FOR SCREENING

  SCRN TIME     SCREEN TAT          DETECTION FRACTION          END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                            DEVEL     MAINT      PV
     .20      1.   1.  15.  60.            .80              40000.     .00     40000.                 1

  SCREENING EQ/REP NUM          TIME USED
         27                        .20

REF MOD  MOD     MODULE       UNIT     WEIGHT   ESS  HAS   WASH    FALSE           TAT             NUM    NUM OF      PARTS COST
NUM NUM  ID       NAME        PRICE                  NSN           REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 19  11  1011  CON MATCH       185.      .42     1   NO    .050     .50      1.   3.   30.  120.    1       17.          25.00

     ALT#   NAME    MTTR  DIAG TIME   PAGES      TPS DEV    TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
      1     STE     1.25     .25        0.        51000.       .00       51000.             2

            EQ/REP NUM    TIME USED
                 4           1.00
                 7            .25

THIS ITEM IS A CANDIDATE FOR SCREENING

  SCRN TIME     SCREEN TAT          DETECTION FRACTION          END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                            DEVEL     MAINT      PV
     .20      1.   1.  15.  60.            .80              40000.     .00     40000.                 1

  SCREENING EQ/REP NUM          TIME USED
         27                        .20

REF MOD  MOD     MODULE       UNIT     WEIGHT   ESS  HAS   WASH    FALSE           TAT             NUM    NUM OF      PARTS COST
NUM NUM  ID       NAME        PRICE                  NSN           REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 20  12  1012  AUD PS          223.      .42     1   NO    .050     .50      1.   3.   30.  120.    1        7.          25.00

     ALT#   NAME  . MTTR  DIAG TIME   PAGES      TPS DEV    TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
      1     STE     1.25     .25        0.        63000.       .00       63000.             2

            EQ/REP NUM    TIME USED
                 4           1.00
                18            .25

THIS ITEM IS A CANDIDATE FOR SCREENING

  SCRN TIME     SCREEN TAT          DETECTION FRACTION          END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                            DEVEL     MAINT      PV
     .10      1.   1.  15.  60.            .80              60000.     .00     60000.                 1

  SCREENING EQ/REP NUM          TIME USED
         28                        .01

REF MOD  MOD     MODULE       UNIT     WEIGHT   ESS  HAS   WASH    FALSE           TAT             NUM    NUM OF      PARTS COST
NUM NUM  ID       NAME        PRICE                  NSN           REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 21  13  1013  AUD I/O         271.      .42     1   NO    .050     .50      1.   3.   30.  120.    1       10.          25.00

     ALT#   NAME    MTTR  DIAG TIME   PAGES      TPS DEV    TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
      1     STE     1.25     .25        0.        45900.       .00     [illegible]          2
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            EQ/REP NUM     TIME USED
                 4            1.00
                16             .25

    THIS ITEM IS A CANDIDATE FOR SCREENING

      SCRN TIME     SCREEN TAT          DETECTION FRACTION           END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                                  DEVEL     MAINT      PV
         .20       1.   1.  15.  60.            .80               40000.     .00      40000.               1

      SCREENING EQ/REP NUM               TIME USED
               27                           .20

  REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS   WASH    FALSE            TAT            NUM    NUM OF      PARTS COST
  NUM NUM   ID      NAME         PRICE                  NSN           REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
   22  14  1014  AUD CON          198.      .42     1   NO    .050     .50      1.   3.   30. 120.    1        7.          25.00

        ALT#   NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
         1     STE      1.25     .25         0.          60000.        .00        60000.            2

            EQ/REP NUM     TIME USED
                 4            1.00
                17             .25

    THIS ITEM IS A CANDIDATE FOR SCREENING

      SCRN TIME     SCREEN TAT          DETECTION FRACTION           END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                                  DEVEL     MAINT      PV
         .20       1.   1.  15.  60.            .80               40000.     .00      40000.               1

      SCREENING EQ/REP NUM               TIME USED
               27                           .20

  REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS   WASH    FALSE            TAT            NUM    NUM OF      PARTS COST
  NUM NUM   ID      NAME         PRICE                  NSN           REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
   23  15  2001  CHAS FILT        658.     6.00     1   NO    .050     .50      1.   3.   30. 120.    1       10.          25.00

        ALT#   NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
         1     STE      1.25     .25         0.          45000.        .00        45000.            2

            EQ/REP NUM     TIME USED
                 4            1.00
                25             .25

    THIS ITEM IS A CANDIDATE FOR SCREENING

      SCRN TIME     SCREEN TAT          DETECTION FRACTION           END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                                  DEVEL     MAINT      PV
         .20       1.   1.  15.  60.            .80               40000.     .00      40000.               1

      SCREENING EQ/REP NUM               TIME USED
               27                           .20

  REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS   WASH    FALSE            TAT            NUM    NUM OF      PARTS COST
  NUM NUM   ID      NAME         PRICE                  NSN           REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
   24  16  2002  AMP HD           333.     1.75     1   NO    .050     .50      1.   3.   30. 120.    1       12.          25.00

        ALT#   NAME     MTTR  DIAG TIME    PAGES        TPS DEV     TPS MAINT    TPS PV     NUMBER OF EQUIP/REP
         1     STE      1.25     .25         0.          45000.        .00        45000.            2

            EQ/REP NUM     TIME USED
                 4            1.00
          [illegible]     [illegible]
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THIS ITEM IS A CANDIDATE FOR SCREENING

  SCRN TIME     SCREEN TAT          DETECTION FRACTION          END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                             DEVEL     MAINT      PV
    .10       1.   1.  15.  60.            .80              40000.      .00      40000.              1

  SCREENING EQ/REP NUM             TIME USED
           28                          .01

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS   WASH    FALSE              TAT             NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN           REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS    PER REPAIR
 25  17  2003  DECODER          168.     1.75     1    NO   .050     .50        1.   3.  30. 120.     1        1.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV     TPS MAINT   TPS PV     NUMBER OF EQUIP/REP
       1     ATE      1.50     .50         0.        43800.        .00       43800.             2

             EQ/REP NUM    TIME USED
                  4           1.00
                  2            .50

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS   WASH    FALSE              TAT             NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN           REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS    PER REPAIR
 26  18  5001  ONE-WATT         496.     5.00     1    NO   .050     .50        1.   3.  30. 120.     1       19.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV     TPS MAINT   TPS PV     NUMBER OF EQUIP/REP
       1     STE      1.25     .25         0.        58500.        .00       58500.             2

             EQ/REP NUM    TIME USED
                  4           1.00
                 22            .25

THIS ITEM IS A CANDIDATE FOR SCREENING

  SCRN TIME     SCREEN TAT          DETECTION FRACTION          END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                             DEVEL     MAINT      PV
    .20       1.   1.  15.  60.            .80              40000.      .00      40000.              1

  SCREENING EQ/REP NUM             TIME USED
           27                          .20

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS   WASH    FALSE              TAT             NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN           REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS    PER REPAIR
 27  19  5002  PWR SUPP         406.     1.50     1    NO   .050     .50        1.   3.  30. 120.     1       22.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV     TPS MAINT   TPS PV     NUMBER OF EQUIP/REP
       1     STE      1.25     .25         0.        47400.        .00       47400.             2

             EQ/REP NUM    TIME USED
                  4           1.00
                 23            .25

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS   WASH    FALSE              TAT             NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN           REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS    PER REPAIR
 28  20  5003  PA CHASIS        941.    26.00     1    NO   .050     .50        1.   3.  30. 120.     1       80.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV     TPS MAINT   TPS PV     NUMBER OF EQUIP/REP
       1     ATE      1.50     .50         0.       106500.        .00      106500.             2

             EQ/REP NUM    TIME USED
                  4           1.00
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REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE           TAT              NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 29  21  6001  ANALOG           153.       .38    1    NO    .050      .50       1.   4.   30.  120.    1        5.            25.00

         ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
           1     ATE      1.50     .50          0.         49500.         .00        49500.              2

                 EQ/REP NUM     TIME USED
                      4            1.00
                      2             .50

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE           TAT              NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 30  22  6002  IVRCU PS          91.       .38    1    NO    .050      .50       1.   3.   30.  120.    1        8.            25.00

         ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
           1     ATE      1.50     .50          0.         49200.         .00        49200.              2

                 EQ/REP NUM     TIME USED
                      4          . 1.00
                      2             .50

  THIS ITEM IS A CANDIDATE FOR SCREENING

    SCRN TIME      SCREEN TAT          DETECTION FRACTION          END TO END TPS          NUMBER OF SCREENING EQUIP/REP
                                                            DEVEL     MAINT       PV
       .20      1.   1.  15.  60.             .80           40000.     .00      40000.                 1

    SCREENING EQ/REP NUM             TIME USED
           27                           .20

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE           TAT              NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 31  23  6003  DECOD/TIM        120.       .38    1    NO    .050      .50       1.   3.   30.  120.    1        2.            25.00

         ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
           1     ATE      1.50     .50          0.        157800.         .00       157800.              2

                 EQ/REP NUM     TIME USED
                      4            1.00
                      3             .50

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE           TAT              NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 32  24  6004  MICRO            185.       .38    1    NO    .050      .50       1.   3.   30.  120.    1        2.            25.00

         ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
           1     ATE      1.50     .50          0.        236700.         .00       236700.              2

                 EQ/REP NUM     TIME USED
                      4            1.00
                      3             .50

REF MOD   MOD    MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE           TAT              NUM    NUM OF      PARTS COST
NUM NUM   ID      NAME         PRICE                  NSN             REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 33  25  6005  IVRCU CHAS       417.      2.00    1    NO    .050      .50       1.   3.   30.  120.    1       25.            25.00

         ALT#    NAME     MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
           1     ATE      1.50     .50          0.        106500.         .00       106500.              2
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EQ/REP NUM	TIME USED
4	1.00
3	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
34	26	5004	MTG TRAT	411.	10.00	1	NO	.250	.50	1.	3.	30.	120.	1	21.	17.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	5.	0.	.00	0.	0

PSEUDO MODULES

REF NUM	MOD NUM	MOD ID	MODULE NAME	AVERAGE PRICE	WEIGHT	ESS	FALSE REMOVAL	TOTAL PARTS	NEW PARTS
35	27	3001	ECCM PTS	25.	.25	1	.50	55	22

THERE ARE 27 MODULES

APPLICATIONS

REF NUM	APP NUM	COMP NUM	MOD NUM	COMP ID	MOD ID	COMPONENT NAME	MODULE NAME	MTBF	FAILURES PER YEAR	ADD REP ALT
37	1	1	1	1000	1001	RT	CHASIS	14007.	.521E-01	0
38	2	1	2	1000	1002	RT	CONTROL	27863.	.262E-01	0
39	3	1	3	1000	1003	RT	PWR ASSY	25974.	.281E-01	0
40	4	1	4	1000	1004	RT	TUNER/MIX	12943.	.564E-01	0
41	5	1	5	1000	1005	RT	IF DEMOD	18861.	.387E-01	0
42	6	1	6	1000	1006	RT	EXCITER	11741.	.622E-01	0
43	7	1	7	1000	1007	RT	SYNTHESIS	15686.	.465E-01	0
44	8	1	8	1000	1008	RT	TWO-WIRE	22650.	.322E-01	0
45	9	1	9	1000	1009	RT	SW ASSY	12840.	.569E-01	0
46	10	1	10	1000	1010	RT	REMOTE I/O	44405.	.164E-01	0
47	11	1	11	1000	1011	RT	CON MATCH	28818.	.253E-01	0
48	12	1	12	1000	1012	RT	AUD PS	32541.	.224E-01	0
49	13	1	13	1000	1013	RT	AUD I/O	14892.	.490E-01	0
50	14	1	14	1000	1014	RT	AUD CON	21968.	.332E-01	0
51	15	2	15	2000	2001	PWER AMP	CHAS FILT	58850.	.124E-01	0
52	16	2	16	2000	2002	PWER AMP	AMP BD	92326.	.791E-02	0
53	17	2	17	2000	2003	PWER AMP	DECODER	120522.	.606E-02	0
54	18	3	27	3000	3001	ECCM	ECCM PTS	12472.	.585E-01	0
55	19	4	18	5000	5001	VEH MOUNT	ONE-WATT	14350.	.509E-01	0
56	20	4	19	5000	5002	VEH MOUNT	PWR SUPP	30286.	.241E-01	0
57	21	4	20	5000	5003	VEH MOUNT	PA CHASIS	72195.	.101E-01	0
58	22	5	21	6000	6001	IVRCU	ANALOG	151371.	.482E-02	0
59	23	5	22	6000	6002	IVRCU	IVRCU PS	219843.	.332E-02	0
60	24	5	23	6000	6003	IVRCU	DECOD/TIM	291099.	.251E-02	0
61	25	5	24	6000	6004	IVRCU	MICRO	205617.	.355E-02	0
62	26	5	25	6000	6005	IVRCU	IVRCU CHAS	178200.	.410E-02	0
63	27	4	26	5000	5004	VEH MOUNT	MTG TRAT	2273457.	.321E-03	0

THERE ARE 27 APPLICATIONS

THERE ARE 1.09 END ITEM FAILURES PER YEAR
THE DERIVED MTBF IS 669. HOURS
THE INPUT MTBF IS 760. HOURS

APEX FOUND OPTIMUM SOLUTION

MAINTENANCE POLICIES BY APPLICATION

APP NUM	COMPONENT NAME	MODULE NAME	REPAIR LEVEL FI	COMP	MOD	FRACTION OF TIME	MODULE PROMOTED	SENSITIVITY FLAG
1	RT	CHASIS	ORG	DSU	GSU	1.000		
2	RT	CONTROL	ORG	DSU	TOSS	1.000		
3	RT	PWR ASSY	ORG	DSU	TOSS	1.000		
4	RT	TUNER/MIX	ORG	DSU	DEP	1.000		
5	RT	IF DEMOD	ORG	DSU	DEP	1.000		
6	RT	EXCITER	ORG	DSU	DEP	1.000		
7	RT	SYNTHESIS	ORG	DSU	DEP	1.000		
8	RT	TWO-WIRE	ORG	DSU	TOSS	1.000		
9	RT	SW ASSY	ORG	DSU	DEP	1.000		
10	RT	REMOTE I/O	ORG	DSU	TOSS	1.000		
11	RT	CON MATCH	ORG	DSU	TOSS	1.000		
12	RT	AUD PS	ORG	DSU	TOSS	1.000		
13	RT	AUD I/O	ORG	DSU	DEP	1.000		
14	RT	AUD CON	ORG	DSU	TOSS	1.000		
15	PWER AMP	CHAS FILT	ORG	GSU	DEP	1.000		
16	PWER AMP	AMP BD	ORG	GSU	TOSS	1.000		
17	PWER AMP	DECODER	ORG	GSU	TOSS	1.000		
18	ECCM	ECCM PTS	ORG	GSU	TOSS	1.000		
19	VEH MOUNT	ONE-WATT	ORG	DSU	DEP	1.000		
20	VEH MOUNT	PWR SUPP	ORG	DSU	DEP	1.000		
21	VEH MOUNT	PA CHASIS	ORG	DSU	TOSS	1.000		
22	IVRCU	ANALOG	ORG	DSU	TOSS	1.000		
23	IVRCU	IVRCU PS	ORG	DSU	TOSS	1.000		
24	IVRCU	DECOD/TIM	ORG	DSU	TOSS	1.000		
25	IVRCU	MICRO	ORG	DSU	TOSS	1.000		
26	IVRCU	IVRCU CHAS	ORG	DSU	TOSS	1.000		
27	VEH MOUNT	MTG TRAT	ORG	DSU	TOSS	1.000		
28	MAN ANT	NONE	ORG	TOSS		1.000		
29	VEN ANT	NONE	ORG	TOSS		1.000		
30	BAT CASE	NONE	ORG	TOSS		1.000		

SCREENING POLICIES BY ITEM

COMPONENT NUMBER	COMPONENT NAME	SCREENED AT	REPAIRED AT	FRAC OF TIME	SENS FLAG
3	FCCM	DSU	GSU	1.0000	

MOD(REF) NUMBER	MODULE NAME	SCREENED AT	REPAIRED AT	FRAC OF TIME	SENS FLAG
9	CHASIS	DSU	GSU	1.0000	
10	CONTROL	DSU	TOSS	1.0000	
11	PWR ASSY	DSU	TOSS	1.0000	
12	TUNER/MIX	DSU	DEP	1.0000	
13	IF DEMOD	DSU	DEP	1.0000	
14	EXCITER	DSU	DEP	1.0000	
15	SYNTHESIS	DSU	DEP	1.0000	
16	TWO-WIRE	DSU	TOSS	1.0000	
17	SW ASSY	DSU	DEP	1.0000	
18	REMOTE I/O	DSU	TOSS	1.0000	
19	CON MATCH	DSU	TOSS	1.0000	
21	AUD I/O	DSU	DEP	1.0000	
22	AUD CON	DSU	TOSS	1.0000	
26	ONE-WATT	DSU	DEP	1.0000	

SPECIAL TEST EQUIPMENT/REPAIRMAN REQUIREMENTS

PECULIAR EQUIPMENT/REPAIRMAN

EQUIP NUM	EQUIPMENT NAME	ECHELON	REQUIREMENT PER SHOP	QUANTITY PER SHOP	TOT QTY AT ECH	HARDWR CST (TOTAL PV)	DEVELOPMENT COST	ACCUMULATING QTY OF THIS EQUIPMENT UP ECHELONS
9	IF STATION	DEP	.009	1	1	156482.	0.	1
10	TUNER STA	DEP	.014	1	1	205045.	0.	1
11	SYN STA	DEP	.011	1	1	201447.	0.	1
12	EXCIT STA	DEP	.015	1	1	212239.	0.	1
15	SWITCH STA	DEP	.014	1	1	97126.	0.	1
16	AUDIO I/O	DEP	.012	1	1	111516.	0.	1
22	ONE WAT ST	DEP	.012	1	1	79140.	0.	1
23	VEH PS STA	DEP	.009	1	1	77341.	0.	1
25	PA CHA STA	DEP	.005	1	1	80939.	0.	1
27	SCREENER	DSU	.002	1	100	37876.	500.	100

TOTAL PRESENT VALUE OF PECULIAR SPECIAL TEST EQUIPMENT/REPAIRMEN(INC. DEVPMT COST) = 1259651.

SPECIAL TEST EQUIPMENT/REPAIRMEN COMMON AT HIGHER ECHELONS

EQUIP NUM	EQUIPMENT NAME	ECHELON	REQUIREMENT PER SHOP	QUANTITY PER SHOP	TOT QTY AT ECH	HARDWR CST (TOTAL PV)	DEVELOPMENT COST	ACCUMULATING QTY OF THIS EQUIPMENT UP ECHELONS
1	COMMON EQ	DSU	.004	.004	.40	44181.	0.	.40
2	USM-410	GSU	.001	.001	.02	69554.	0.	.02
3	USM-465	GSU	.002	.002	.06	7563.	0.	.06
4	REP VAN	GSU	.008	.008	.19	66815.	0.	.19
4	REP VAN	DEP	.548	.548	.55	29555.	0.	.74

TOTAL PRESENT VALUE OF EQUIPMENT/REPAIRMEN WHERE COMMON = 217668.

TOTAL PRESENT VALUE OF SPECIAL TEST EQUIPMENT/REPAIRMEN REQUIRED = 1477319.

LOGISTICS COSTS
LOGISTICS COSTS FOR COMPONENTS (PRESENT VALUE).

COMP NUM	COMPONENT NAME	INITIAL SPARES($)	CONSUMP. SPARES($)	LABOR COST	IPS COST	OTHER COST	TOTAL COST
1	RT	1,187,490.	742,646.	99,353.	0.	729,593.	2,759,082.
2	PWER AMP	50,400.	7,005.	23,721.	43,200.	61,935.	186,261.
3	ECCM	143,220.	66,948.	49,024.	893,000.	171,661.	1,323,854.
4	VEH MOUNT	207,760.	44,118.	15,547.	0.	190,713.	458,139.
5	IVRCU	1,680.	4,051.	3,331.	0.	31,498.	40,559.
6	MAN ANT	35,568.	99,117.	0.	0.	167,590.	302,275.
7	VEN ANT	228,480.	790,459.	0.	0.	772,099.	1,791,038.
8	RAT CASE	36,800.	119,984.	0.	0.	150,004.	306,788.
COMPONENT COLUMN TOTALS:		1,891,398.	1,874,328.	190,976.	936,200.	2,275,093.	7,167,996.

LOGISTICS COSTS FOR MODULES (PRESENT VALUE).

MOD NUM	MODULE NAME	INITIAL SPARES($)	CONSUMP. SPARES($)	LABOR COST	TPS COST	PARTS COST	OTHER COST	TOTAL COST
1	CHASIS	122,583.	95,798.	43,215.	233,700.	123,130.	248,850.	867,276.
2	CONTROL	46,986.	194,977.	0.	40,000.	0.	53,027.	334,990.
3	PWR ASSY	29,260.	104,031.	0.	40,000.	0.	50,774.	224,065.
4	TUNER/MIX	55,554.	28,990.	35,942.	52,500.	75,044.	137,563.	385,594.
5	IF DEMOD	40,567.	18,127.	24,665.	54,000.	51,191.	99,104.	287,653.
6	EXCITER	121,590.	78,273.	39,622.	87,000.	118,374.	252,873.	697,733.
7	SYNTHESIS	55,080.	32,785.	29,657.	63,000.	68,710.	134,208.	383,440.
8	TWO-WIRE	28,899.	107,368.	0.	40,000.	0.	55,004.	231,271.
9	SW ASSY	57,652.	30,113.	36,230.	69,000.	68,325.	122,381.	383,702.
10	REMOTE I/O	21,384.	77,826.	0.	40,000.	0.	36,679.	175,889.
11	CON MATCH	26,640.	91,297.	0.	40,000.	0.	47,244.	205,181.
12	AUD PS	35,903.	130,526.	0.	0.	0.	51,114.	217,542.
13	AUD I/O	35,230.	17,330.	31,238.	45,000.	53,373.	92,566.	274,737.
14	AUD CON	34,056.	128,181.	0.	40,000.	0.	57,286.	259,523.
15	CHAS FILT	16,450.	10,648.	8,413.	45,000.	18,907.	36,652.	136,070.
16	AMP HD	13,986.	68,698.	0.	0.	0.	10,997.	93,681.
17	DECODER	5,544.	26,550.	0.	0.	0.	7,723.	39,817.
18	ONE-WATT	54,064.	32,917.	32,418.	58,500.	62,263.	126,984.	367,146.
19	PWR SUPP	31,668.	12,767.	16,347.	47,400.	38,258.	93,830.	240,270.
20	PA CHASIS	49,873.	248,259.	0.	0.	0.	35,781.	333,912.
21	ANALOG	4,131.	19,252.	0.	0.	0.	9,335.	32,718.
22	IVRCU PS	3,913.	7,884.	0.	0.	0.	19,453.	31,250.
23	DECOD/TIM	1,800.	7,852.	0.	0.	0.	5,874.	15,526.
24	MICRO	3,700.	17,137.	0.	0.	0.	7,636.	28,473.
25	IVRCU CHAS	9,591.	44,571.	0.	0.	0.	9,959.	64,121.
26	MTG TRAT	1,233.	3,443.	0.	0.	0.	3,102.	7,778.
27	FCCM PTS	9,625.	36,637.	0.	0.	0.	104,736.	150,997.
MODULE COLUMN TOTALS:		916,962.	1,672,237.	297,747.	995,100.	677,575.	1,910,735.	6,470,355.

SCREENING COSTS & SAVINGS FOR COMPONENTS
(EXCLUDING TE/REPAIRMEN SAVINGS)

COMP NUM	COMPONENT NAME	SCRNG LABOR COST	REPAIR SAVINGS	LOGISTICS SAVINGS	IS TPS ONLY FOR SCREENING?
3	ECCM	6458.	2421.	42206.	NO
COMPONENT COLUMN TOTALS		6458.	2421.	42206.	

SCREENING COSTS & SAVINGS FOR MODULES
(EXCLUDING TE/REPAIRMEN SAVINGS)

MOD NUM	MODULE NAME	SCREENING COST	REPAIR SAVINGS	LOGISTICS SAVINGS	IS TPS ONLY FOR SCREENING?
1	CHASIS	5692.	2134.	76533.	NO
2	CONTROL	2862.	0.	106847.	YES
3	PWR ASSY	3070.	0.	67055.	YES
4	TUNER/MIX	6160.	2310.	49624.	NO
5	IF DEMOD	4227.	1585.	41960.	NO
6	EXCITER	6791.	2546.	99701.	NO
7	SYNTHESIS	5083.	1906.	57973.	NO
8	TWO-WIRE	3520.	0.	72173.	YES
9	SW ASSY	6210.	2328.	51269.	NO
10	REMOTE I/O	1796.	0.	47740.	YES
11	CON MATCH	2767.	0.	59331.	YES
13	AUD I/O	5354.	2007.	37579.	NO
14	AUD CON	3630.	0.	81760.	YES
18	ONE-WATT	5556.	2083.	58153.	NO
MODULE COLUMN TOTALS		62718.	16899.	907697.	

MTD & RTD & TURN AROUND TIME

COMPONENT NUMBER	COMPONENT NAME	WASH	MTD ORG	MTD DSU	MTD GSU	MTD DEP	RTD ORG	RTD DSU	RTD GSU	RTD DEP	TAT(INC SRU WAIT) ORG	TAT DSU	TAT GSU	TAT DEP
1	RT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	37.3	30.0	120.0
2	PWER AMP	.010	.000	.000	.990	.000	1.000	.000	.000	.000	1.0	3.0	75.7	120.0
3	ECCM	.050	.000	.253	.697	.000	1.000	.000	.000	.000	1.0	1.0	90.0	120.0
4	VEH MOUNT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	49.7	30.0	120.0
5	IVRCU	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	85.1	30.0	120.0
6	MAN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
7	VEN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
8	BAT CASE	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0

WASH & MTD & TAT WITHOUT SCREENING

COMPONENT NUMBER	COMPONENT NAME	WASH	MTD ORG	MTD DSU	MTD GSU	MTD DEP	RTD ORG	RTD DSU	RTD GSU	RTD DEP	TAT ORG	TAT DSU	TAT GSU	TAT DEP
1	RT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	37.3	30.0	120.0
2	PWER AMP	.010	.000	.000	.990	.000	1.000	.000	.000	.000	1.0	3.0	75.7	120.0
3	ECCM	.050	.000	.000	.950	.000	1.000	.000	.000	.000	1.0	3.0	90.0	120.0
4	VEH MOUNT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	49.7	30.0	120.0
5	IVRCU	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	85.1	30.0	120.0
6	MAN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
7	VEN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
8	BAT CASE	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0

MTD & RTD & TURN AROUND TIME

MODULE NUMBER	MODULE NAME	WASH	MTD				RTD				TAT INC WAIT			
			ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP
1	CHASIS	.050	.000	.253	.697	.000	.000	1.000	.000	.000	1.0	1.0	99.8	120.0
2	CONTROL	.747	.000	.253	.000	.000	.000	1.000	.000	.000	1.0	1.0	30.0	120.0
3	PWR ASSY	.747	.000	.253	.000	.000	.000	1.000	.000	.000	1.0	1.0	30.0	120.0
4	TUNER/MIX	.050	.000	.253	.000	.697	.000	1.000	.000	.000	1.0	1.0	30.0	121.9
5	IF DEMOD	.050	.000	.253	.000	.697	.000	1.000	.000	.000	1.0	1.0	30.0	122.1
6	EXCITER	.050	.000	.253	.000	.697	.000	1.000	.000	.000	1.0	1.0	30.0	121.7
7	SYNTHESIS	.050	.000	.253	.000	.697	.000	1.000	.000	.000	1.0	1.0	30.0	121.8
8	TWO-WIRE	.747	.000	.253	.000	.000	.000	1.000	.000	.000	1.0	1.0	30.0	120.0
9	SW ASSY	.050	.000	.253	.000	.697	.000	1.000	.000	.000	1.0	1.0	30.0	122.1
10	REMOTE I/O	.747	.000	.253	.000	.000	.000	1.000	.000	.000	1.0	1.0	30.0	120.0
11	CON MATCH	.747	.000	.253	.000	.000	.000	1.000	.000	.000	1.0	1.0	30.0	120.0
12	AUD PS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
13	AUD I/O	.050	.000	.253	.000	.697	.000	1.000	.000	.000	1.0	1.0	30.0	122.7
14	AUD CON	.747	.000	.253	.000	.000	.000	1.000	.000	.000	1.0	1.0	30.0	120.0
15	CHAS FILT	.050	.000	.000	.000	.950	.000	.000	1.000	.000	1.0	3.0	30.0	123.5
16	AMP BD	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	1.0	3.0	30.0	120.0
17	DECODER	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	1.0	3.0	30.0	120.0
18	ONE-WATT	.050	.000	.253	.000	.697	.000	1.000	.000	.000	1.0	1.0	30.0	122.6
19	PWR SUPP	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	124.2
20	PA CHASIS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
21	ANALOG	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
22	IVRCU PS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
23	DECOD/TIM	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
24	MICRO	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
25	IVRCU CHAS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
26	MTG TRAT	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
27	ECCM PTS	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	.0	.0	.0	.0

WASH & MTD & TAT WITHOUT SCREENING

MODULE NUMBER	MODULE NAME	WASH	MTD ORG	MTD DSU	MTD GSU	MTD DEP	RTD ORG	RTD DSU	RTD GSU	RTD DEP	TAT ORG	TAT DSU	TAT GSU	TAT DEP
1	CHASIS	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	99.8	120.0
2	CONTROL	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
3	PWR ASSY	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
4	TUNER/MIX	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	121.9
5	IF DEMOD	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	122.1
6	EXCITER	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	121.7
7	SYNTHESIS	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	121.8
8	TWO-WIRE	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
9	SW ASSY	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	122.1
10	REMOTE I/O	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
11	CON MATCH	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
12	AUD PS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
13	AUD I/O	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	122.7
14	AUD CON	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
15	CHAS FILT	.050	.000	.000	.000	.950	.000	.000	1.000	.000	1.0	3.0	30.0	123.5
16	AMP BD	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	1.0	3.0	30.0	120.0
17	DECODER	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	1.0	3.0	30.0	120.0
18	ONE-WATT	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	122.6
19	PWR SUPP	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	124.2
20	PA CHASIS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
21	ANALOG	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
22	IVRCU PS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
23	DECOD/TIM	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
24	MICRO	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
25	IVRCU CHAS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
26	MTG TRAT	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
27	ECCM PTS	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	.0	.0	.0	.0

SESAME OUTPUT FOR COMPONENTS

SPARES

NUMBER	COMPONENT NAME	ALLOWANCES PER CLAIMANT ORG	OSU	GSU	DEPOT	QTY * UP	FAIL PER END ITEM PER YR
1	RT	0.	2.	0.	30.	1,187,490.	.819
2	PWER AMP	0.	0.	2.	2.	50,400.	.040
3	ECCM	0.	1.	2.	17.	143,220.	.088
4	VEH MOUNT	0.	1.	0.	6.	207,760.	.128
5	IVRCU	0.	0.	0.	2.	1,680.	.027
6	MAN ANT	0.	2.	1.	244.	35,568.	.074
7	VEH ANT	0.	2.	2.	432.	76,160.	.134
8	BAT CASE	0.	1.	1.	196.	36,800.	.059

SESAME OUTPUT FOR MODULES

SPARES

NUMBER	MODULE NAME	ALLOWANCES PER CLAIM. ORG	DSU	GSU	DEPOT	QTY * UP	FAIL PER END ITEM PER YR
1	CHASIS	0.	0.	3.	15.	122,583.	.077
2	CONTROL	0.	0.	1.	99.	46,986.	.039
3	PWR ASSY	0.	0.	2.	106.	29,260.	.042
4	TUNER/MIX	0.	0.	2.	93.	55,554.	.084
5	IF DEMOD	0.	0.	2.	65.	40,567.	.057
6	EXCITER	0.	0.	1.	102.	121,590.	.092
7	SYNTHESIS	0.	0.	1.	78.	55,080.	.069
8	TWO-WIRE	0.	0.	2.	121.	28,899.	.048
9	SW ASSY	0.	0.	2.	94.	57,652.	.084
10	REMOTE I/O	0.	0.	1.	64.	21,384.	.024
11	CON MATCH	0.	0.	2.	96.	26,640.	.038
12	AUD PS	0.	0.	2.	113.	35,903.	.033
13	AUD I/O	0.	0.	2.	82.	35,230.	.073
14	AUD CON	0.	0.	2.	124.	34,056.	.049
15	CHAS FILT	0.	0.	0.	25.	16,450.	.018
16	AMP HD	0.	0.	0.	42.	13,986.	.012
17	DECODER	0.	0.	0.	33.	5,544.	.009
18	ONE-WATT	0.	0.	1.	85.	54,064.	.076
19	PWR SUPP	0.	0.	1.	54.	31,668.	.036
20	PA CHASIS	0.	0.	0.	53.	49,873.	.015
21	ANALOG	0.	0.	0.	27.	4,131.	.007
22	IVRCU PS	0.	0.	1.	19.	3,913.	.005
23	DECOD/TIM	0.	0.	0.	15.	1,800.	.004
24	MICRO	0.	0.	0.	20.	3,700.	.005
25	IVRCU CHAS	0.	0.	0.	23.	9,591.	.006
26	MTG TRAT	0.	0.	0.	3.	1,233.	.000
27	ECCM PTS	0.	0.	0.	7.	175.	.002

```
LOGISTICS TOTALS

 INITIAL SPARES COST                              2,969,910.

 CONSUMPTION SPARES (PRESENT VALUE)               3,824,916.

 INVENTORY HOLDING COST (PRESENT VALUE)             711,565.

 TRANSPORTATION COST (PRESENT VALUE)                115,183.

 REQUISITION COST (PRESENT VALUE)                 1,866,371.

 CATALOGING COST (PRESENT VALUE)                    705,774.

 BIN COST (PRESENT VALUE)                           905,035.

 REPAIR COST (PRESENT VALUE)                        488,724.

  SCREENING COST                                     69,175.

 DOCUMENTATION COST                                  50,400.

 TEST PROGRAM SETS COST                           1,931,300.
------------------------------------------------------------
TOTAL LOGISTICS COST                             13,638,353.

FOLLOWING SAVINGS ALREADY CONSIDERED IN ABOVE TOTAL

LOGISTICS SAVINGS DUE TO SCREEN      949903.

  REPAIR SAV DUE TO SCREEN           19320.



TOTAL COST FOR THIS MAINTENANCE CONCEPT IN TERMS OF PRESENT VALUE

 TOTAL LOGISTICS COST                         13,638,353.

 TOTAL TEST EQUIPMENT/REPAIRMAN COST           1,477,319.
------------------------------------------------------
TOTAL                                         15,115,672.

OPERATIONAL AVAILABILITY ACHIEVED       AND        CURVE PARAM USED
        .9674                                         4902.6
```

POLICY FILE

123	1	1.0000
125	2	1.0000
125	3	1.0000
124	4	1.0000
124	5	1.0000
124	6	1.0000
124	7	1.0000
125	8	1.0000
124	9	1.0000
125	10	1.0000
125	11	1.0000
125	12	1.0000
124	13	1.0000
125	14	1.0000
134	15	1.0000
135	16	1.0000
135	17	1.0000
135	18	1.0000
124	19	1.0000
124	20	1.0000
125	21	1.0000
125	22	1.0000
125	23	1.0000
125	24	1.0000
125	25	1.0000
125	26	1.0000
125	27	1.0000
155	28	1.0000
155	29	1.0000
155	30	1.0000
CRV	323S	1.0000
CRV	923S	1.0000
CRV	1025S	1.0000
CRV	1125S	1.0000
CRV	1224S	1.0000
CRV	1324S	1.0000
CRV	1424S	1.0000
CRV	1524S	1.0000
CRV	1625S	1.0000
CRV	1724S	1.0000
CRV	1825S	1.0000
CRV	1925S	1.0000
CRV	2124S	1.0000
CRV	2225S	1.0000
CRV	2624S	1.0000

OTHER COST BREAKOUT

OTHER LOGISTICS COSTS FOR COMPONENTS (PRESENT VALUE).

COMP NUM	COMPONENT NAME	HOLDING	TRANSP.	REQ	BIN	CATLOG	DOCUM.
1	RT	284,513.	26,866.	348,893.	50,726.	1,796.	16,800.
2	PWER AMP	12,075.	2,291.	33,216.	12,556.	1,796.	0.
3	ECCM	34,314.	407.	65,907.	62,780.	1,796.	0.
4	VEH MOUNT	49,778.	17,017.	54,597.	50,726.	1,796.	16,800.
5	TVRCU	403.	300.	11,697.	502.	1,796.	16,800.
6	MAN ANT	8,522.	1,453.	93,040.	62,780.	1,796.	0.
7	VEN ANT	54,7 2.	23,880.	499,750.	188,340.	5,388.	0.
8	RAT CASE	8,817.	2,179.	74,432.	62,780.	1,796.	0.
		--------	-------	----------	--------	-------	-------
COMPONENT COLUMN TOTALS:		·53,164.	74,393.	1,181,532.	491,190.	17,960.	50,400.

OTHER LOGISTICS COSTS FOR MODULES (PRESENT VALUE).

MOD NUM	MODULE NAME	HOLDING	TRANSP.	REQ	BIN	CATLOG	DOCUM.
1	CHASIS	29,370.	1,272.	25,761.	12,556.	174,199.	0.
2	CONTROL	11,257.	281.	24,275.	12,556.	1,796.	0.
3	PWR ASSY	7,010.	301.	26,041.	12,556.	1,796.	0.
4	TUNER/MIX	13,310.	1,198.	52,258.	12,556.	52,080.	0.
5	IF DEMOD	9,720.	822.	35,861.	12,556.	35,917.	0.
6	EXCITER	29,132.	1,321.	57,608.	12,556.	145,465.	0.
7	SYNTHESIS	13,197.	989.	43,120.	12,556.	59,263.	0.
8	TWO-WIRE	6,924.	345.	29,862.	12,556.	1,796.	0.
9	SW ASSY	13,813.	1,208.	52,678.	12,556.	35,917.	0.
10	REMOTE I/O	5,123.	176.	15,232.	12,556.	1,796.	0.
11	CON MATCH	6,383.	272.	23,471.	12,556.	1,796.	0.
12	AUD PS	8,602.	322.	27,838.	12,556.	1,796.	0.
13	AUD I/O	8,441.	1,041.	45,419.	12,556.	19,754.	0.
14	AUD CON	8,160.	356.	30,789.	12,556.	1,796.	0.
15	CHAS FILT	3,941.	4,758.	7,696.	502.	19,754.	0.
16	AMP BD	3,351.	442.	4,906.	502.	1,796.	0.
17	DECODER	1,328.	339.	3,758.	502.	1,796.	0.
18	ONE-WATT	12,953.	12,867.	47,134.	12,556.	35,917.	0.
19	PWR SUPP	7,587.	2,472.	29,910.	12,556.	41,30[illegible].	0.
20	PA CHASIS	11,949.	8,986.	12,547.	502.	1,796.	0.
21	ANALOG	990.	63.	5,984.	502.	1,796.	0.
22	IVRCU PS	938.	43.	4,121.	12,556.	1,796.	0.
23	DECOD/TIM	431.	33.	3,112.	502.	1,796.	0.
24	MICRO	886.	46.	4,406.	502.	1,796.	0.
25	IVRCU CHAS	2,298.	280.	5,083.	502.	1,796.	0.
26	MTG TRAT	295.	110.	398.	502.	1,796.	0.
27	ECCM PTS	2,306.	449.	34,849.	27,623.	39,509.	0.
MODULE COLUMN TOTALS:		219,695.	40,792.	654,117.	245,593.	687,816.	0.

LOGISTICS COSTS FOR PARTS (PRESENT VALUE).
(PARTS CATALOGING COSTS ARE INCLUDED IN MODULE CATALOGING COSTS)

USED ON MOD. NUM	USED ON MOD. NAME	INITIAL PARTS($)	CONSUMP. PARTS($)	HOLD COST	REQ COST	RIN COST
1	CHASIS	9,600.	32,295.	2,300.	30,719.	48,215.
4	TUNER/MIX	21,000.	34,950.	5,031.	0.	14,063.
5	IF DEMOD	14,250.	23,984.	3,414.	0.	9,543.
6	EXCITER	32,000.	38,528.	7,667.	0.	40,179.
7	SYNTHESIS	19,200.	28,839.	4,600.	0.	15,072.
9	SW ASSY	19,000.	35,231.	4,552.	0.	9,543.
13	AUD I/O	14,500.	30,376.	3,474.	0.	5,022.
15	CHAS FILT	5,000.	7,687.	1,198.	0.	5,022.
18	ONE-WATT	17,100.	31,523.	4,097.	0.	9,543.
19	PWR SUPP	9,900.	14,936.	2,372.	0.	11,049.
		--------	--------	-------	-------	--------
PART COLUMN TOTALS:		161,550.	278,350.	38,706.	30,719.	168,250.

```
AVAIL & CURVE PAR     .9237        1000.
AVAIL & CURVE PAR     .9928      100000.
AVAIL & CURVE PAR     .9809       10000.
AVAIL & CURVE PAR     .9369        3162.
AVAIL & CURVE PAR     .9701        5623.
AVAIL & CURVE PAR     .9406        4217.
AVAIL & CURVE PAR     .9585        4870.
AVAIL & CURVE PAR     .9678        5233.
AVAIL & CURVE PAR     .9674        5048.
AVAIL & CURVE PAR     .9674        4958.
AVAIL & CURVE PAR     .9674        4914.
AVAIL & CURVE PAR     .9585        4892.
AVAIL & CURVE PAR     .9674        4903.
AVAIL & CURVE PAR     .9585        4897.
AVAIL & CURVE PAR     .9674        4903.
AVAIL & CURVE PAR     .9674        4903.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE P.      .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVAIL & CURVE PAR     .0000           0.
AVE WAIT(DAYS) FOR SRU BY ECHELON         .00      37.28      55.42        .00
AVERAGE DOWN TIME (IN DAYS) DUE TO CTDEL IS:    .00
AVE REPAIR COST BY ECHELON         .00  15051.56  15073.93  33666.62

 TO OBTAIN AVG PRODUCTIVE REPAIR HRS AT
ECHELON K, DIVIDE BY EFFECTIVE LABOR RATE AT K
(SEE PREPROCESSOR)
```

STOCKAGE LISTS

ORGANIZATION UNIT STOCKAGE LIST

THERE ARE NO ITEMS ON LIST

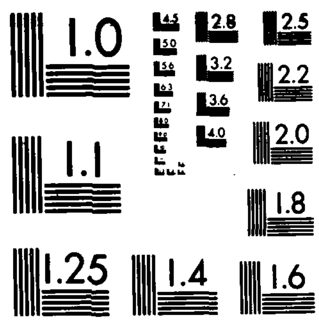
DIRECT SUPPORT UNIT STOCKAGE LIST

NUM	NAME	TYPE/ESS.		QUANTITY	$ VALUE
1	RT	C	1	2.	10,326.
3	FCCM	C	1	1.	868.
4	VEH MOUNT	C	1	1.	1,960.
6	MAN ANT	C	1	2.	152.
7	VEN ANT	C	1	2.	224.
8	BAT CASE	C	1	1.	115.

TOTAL DOLLAR VALUE OF LIST IS: 13,645.

AD-A193 223 OPTIMUM SUPPLY AND MAINTENANCE MODEL RELEASE 20 USER'S GUIDE(U) ARMY COMMUNICATIONS-ELECTRONICS COMMAND FORT MONMOUTH NJ C J PLUMERI SEP 87 CECOM-TR-87-3 2/3

UNCLASSIFIED F/G 15/5 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

APPENDIX G

SAMPLE MULTIPLE REPAIR ALTERNATIVE RUN

Sample input and output files from a multiple repair alternative run are contained in this appendix. While the data was derived from a real system, some of it has been modified to demonstrate certain features of the OSAMM. Thus, no data from this appendix should be used in any other analysis. Furthermore, the data in this appendix should not be compared to that in any of the other sample runs in this manual.

INPUT FILE

```
2 111
SINCGARS V        8325  15      730     0700     25 960 1          1
  1    3  30 120 0 0
6V  500 100  24  2200    2  40   40 510 760    15  30  30
 706105917251725 6868                                        01177  00034  00035
          65340  16247  22016    3532      03   2378  300
 1 COMMON EU               15 1 2
  34990  1768
02 USM-410                    2 3
                                          1724000101500        1145000101500
03 USM-465                    2 3
                                            71000101500
04 REP VAN                    2 3 1
                                           193750101500          30000101500
05 MARATHONCP                 4 3
 271000101500
06 MARATHONST                 4 3
 478600101500
07 AC STATION                 4 4
  54000101500
09 IF STATION                 4 4
  87000101500
10 TUNER STA                  4 4
 114000101500
11 SYN STA                    4 4
 112000101500
12 EXCIT STA                  4 4
 118000101500
13 PA STA                     4 4
  30000101500
15 SWITCH STA                 4 4
  54000101500
16 AUDIO I/O                  4 4
  62000101500
17 AUD CON STA                4 4
  62000101500
18 AUD PS STA                 4 4
  58000101500
19 TWO WIRE S                 4 4
  47000101500
22 ONE WAT STA                4 4
  44000101500
23 VEH PS STA                 4 4
  43000101500
25 PA CHA STA                 4 4
  45000101500
26 AMP RD STA                 4 4
  45000101500
99
99
1000RT            5163  10501     1            1
ALT1     5          56              01
2000PWER AMP      1008   9501     1            1
ATE     15     5            43200    4   1   2   5
3000FCCM           868    751   050                2
ATE     15     5           8930000   4   1   3   5
STE    125    25            870000   4   1   5   06 6   25
5000VEH MOUNT     1960  42501     1            1
ALT1     5          56              01
6000IVRCU          840   3501     1            1
ALT1     5          56              01
9999
7000MAN ANT         76    8 1     1    1     14752
8000VEH ANT        112   2431     3    3      2726
9000BAT CASE       115   15 1     1    1     18440
9999
```

```
1001CHASIS        1409   5  1    5                2  25     96
ALTI     15      5            2337000  4  1   3   5
STE     125     25             540000  4  1   5   06 6   25
1002CONTROL        382    421    5                2  25     14
ATE      15      5            4782000  4  1   3   5
STE     125     25             900000  4  1   5   06 6   25
1003PWR ASSY       190    421    5                2  25     13
ATE      15      5             663000  4  1   2   5
STE     125     25             510000  4  1  13   25
1004TUNER/MIX      394    421    5                2  25     28
ATE      15      5             579000  4  1   2   5
STE     125     25             525000  4  1  10   25
1005IF DEMOD       359    421    5                2  25     19
ATE      15      5             504000  4  1   2   5
STE     125     25             540000  4  1   9   25
1006EXCITER        965   .421    5                2  25     80
ATE      15      5            2013000  4  1   2   5
STE     125     25             870000  4  1  12   25
1007SYNTHESIS      540    421    5                2  25     32
ATE      15      5            1182000  4  1   2   5
STE     125     25             630000  4  1  11   25
1008TWO-WIRE       171    421    5                2  25     15
ATE      15      5             609000  4  1   2   5
STE     125     25             475000  4  1  19   25
1009SW ASSY        406    421    5                2  25     19
ATE      15      5            3240000  4  1   2   5
STE     125     25             690000  4  1  15   25
1010REMOTE I/O     243    421    5                2  25      4
ATE      15      5            3669000  4  1   3   5
STE     125     25             690000  4  1   5   06 6   25
1011CON MATCH      185    421    5                2  25     17
ATE      15      5             771000  4  1   2   5
STE     125     25             510000  4  1   7   25
1012AUD PS         223    421    5                2  25      7
ATE      15      5             468000  4  1   2   5
STE     125     25             630000  4  1  18   25
1013AUD I/O        271    421    5                2  25     10
ATE      15      5             519000  4  1   2   5
STE     125     25             450000  4  1  16   25
1014AUD CON        198    421    5                2  25      7
ATE      15      5            1359000  4  1   3   5
STE     125     25             600000  4  1  17   25
2001CHAS FILT      658   6  1    5                2  25     10
ATE      15      5             516000  4  1   2   5
STE     125     25             450000  4  1  25   25
2002AMP BD         333   1751    5                2  25     12
ATE      15      5             390000  4  1   2   5
STE     125     25             450000  4  1  26   25
2003DECODER        168   1751    5                1  25      1
ATE      15      5             438000  4  1   2   5
5001ONE-WATT       496   5  1    5                2  25     19
ATE      15      5             450000  4  1   2   5
STE     125     25             585000  4  1  22   25
5002PWR SUPP       406   15 1    5                2  25     22
ATE      15      5             582000  4  1   2   5
STE     125     25             474000  4  1  23   25
5003PA CHASIS      941   26  1   5                2  25     80
ATE      15      5            1065000  4  1   3   5
STE     125     25             350000  4  1   5   06 6   25
6001ANALOG         153    381    5                1  25      5
ATE      15      5             495000  4  1   2   5
6002IVRCU PS        91    381    5                1  25      8
ATE      15      5             492000  4  1   2   5
6003DECOD/TIM      120    381    5                1  25      2
ATE      15      5            1578000  4  1   3   5
[illegible]
```

```
AIE      15      5              2367000   4   1    3    5
6005IVRCU CHAS     417    2   1     5                   2   25        25
AIE      15      5              1065000   4   1    3    5
STF      125     25              450000   4   1    5    06 6    25
5004MTG TRAT         411   10   1    25                 1   17        21
ALTI     5                5
9999
3001ECCM PTS          25      251     55     22
9999
10001001       14007
10001002       27863
10001003       25974
10001004       12943
10001005       18861
10001006       11741
10001007       15686
10001008       22650
10001009       12840
10001010       44405
10001011       28818
10001012       32541
10001013       14892
10001014       21968
20002001       58850
20002002       92326
20002003      120522
30003001       12472
50005001       14350
50005002       30286
50005003       72195
60006001      151371
60006002      219843
60006003      291099
60006004      205617
60006005      178200
50005004     2273457
9999
```

MAIN OUTPUT FILE

OPTIMUM SUPPLY AND MAINTENANCE MODEL PREPROCESSOR

VERSION DATE 87/07/28

RUN DATE 87/09/02.

THIS RUN EXAMINES MULTIPLE REPAIR ALTERNATIVES

REPAIR END ITEM	LOWEST ECHELON TO REPAIR COMPONENTS	REPAIR MODULES
ORG	ORG	ORG

END ITEM INFORMATION

END ITEM	PRICE	LIFE (YEARS)	OPERATING HOURS	MTBF (HOURS)	MTR (HOURS)	AVAILABILITY TARGET	UNSERVICEABLE RETURN RATE	FALSE REMOVAL DEFAULT
SINCGARS V	8325.	15	730.	700.	.25	.960	1.00	.10

TAT DEFAULTS (USED ONLY IF TAT IS NOT INPUT WITH EACH COMPONENT OR MODULE)

ORG	DSU	GSU	DEP
1.	3.	30.	120.

THERE ARE NO TEST EQUIPMENTS OR SPECIAL REPAIRMEN NEEDED TO REPAIR THE END ITEM

DEPLOYMENT INFORMATION

RSC	IVSYS	CLAIMANTS ORG	CLAIMANTS DSU	CLAIMANTS GSU	DENSITY	OST ORG-DSU	OST DSU-GSU	OST GSU-DEP	PLT	CONTACT DELAY	OPERATING LEVEL ORG	OPERATING LEVEL DSU	OPERATING LEVEL GSU
6	V	500.	100.	24.	2200.	2.0	40.0	40.0	510.0	760.0	15.0	30.0	30.0

AVERAGE OUPS

4.4	22.0	91.7

DISTANCE (MILES) BETWEEN

ORG-DSU	DSU-GSU	GSU-DEPOT
7.	250.	3500.

COST PARAMETERS

LABOR RATES

	ORG	DSU	GSU	DEPOT
BASE	7.06	10.59	17.25	17.25
LOADED	11.86	17.79	25.01	25.01
PROD FAC	.85	.85	.85	.85
EFFECTIVE	13.95	20.93	29.43	29.43

TRANSPORTATION COST

	ORG-DSU	DSU-GSU	GSU-DEPOT
PER LB-MI	.01177	.00034	.00035
PER POUND	.08	.09	1.23

OTHER COSTS

INITIAL CATALOG	RECURRING CATALOG	INITIAL BIN	RECURRING BIN	HOLDING FRACTION	COST PER REQUISITION	COST PER PAGE OF TECH DOC
653.40	162.47	220.16	35.32	.03	23.78	300.00

COST PARAMETERS IN TERMS OF PRESENT VALUE
(PVF = 7.9863835)

LABOR RATE (PRESENT VALUE)

ORG	DSU	GSU	DEPOT
111.44	167.16	235.01	235.01

TRANSPORTATION COST (PRESENT VALUE)

ORG-DSU	DSU-GSU	GSU-DEP
.66	.68	9.78

COSNSN	COSBIN	COSREQ
1795.86	502.24	189.92

TEST EQUIPMENT DATA

EQUIPMENT NUMBER 1

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
COMMON EQ	0.	15	ORG	DSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DSU	34990.	.27	0.	1768.	110440.
GSU	34990.	.27	0.	1768.	110440.
DEP	34990.	.27	0.	1768.	110440.

EQUIPMENT NUMBER 2

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
USM-410	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	1724000.	.10	0.	1500.	3100853.
DEP	1145000.	.10	0.	1500.	2059441.

EQUIPMENT NUMBER 3

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
USM-465	0.	15	DSU	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	71000.	.10	0.	1500.	127703.
DEP	71000.	.10	0.	1500.	127703.

EQUIPMENT NUMBER 4

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
REP VAN	0.	15	DSU	GSU	YES

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	193750.	.10	0.	1500.	348486.
DEP	30000.	.10	0.	1500.	53959.

EQUIPMENT NUMBER 5

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
MARATHONCP	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE	INSTALLATION	AVAILABLE

		FACTOR		TEST HOURS	VALUE
GSU	271000.	.10	0.	1500.	487431.
DEP	271000.	.10	0.	1500.	487431.

EQUIPMENT NUMBER 6

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
MARATHONST	0.	15	DEP	GSU	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
GSU	478600.	.10	0.	1500.	860829.
DEP	478600.	.10	0.	1500.	860828.

EQUIPMENT NUMBER 7

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AC STATION	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	54000.	.10	0.	1500.	97126.

EQUIPMENT NUMBER 9

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
IF STATION	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	87000.	.10	0.	1500.	156482.

EQUIPMENT NUMBER 10

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
TUNER STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	114000.	.10	0.	1500.	205045.

EQUIPMENT NUMBER 11

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
SYN STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	112000.	.10	0.	1500.	201447.

EQUIPMENT NUMBER 14

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
EXCIT STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	118000.	.10	0.	1500.	212239.

EQUIPMENT NUMBER 13

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
PA STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	30000.	.10	0.	1500.	53959.

EQUIPMENT NUMBER 15

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
SWITCH STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	54000.	.10	0.	1500.	97126.

EQUIPMENT NUMBER 16

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AUDIO I/O	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	62000.	.10	0.	1500.	111516.

EQUIPMENT NUMBER 17

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AUD CON ST	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	62000.	.10	0.	1500.	111516.

EQUIPMENT NUMBER 18

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AUD PS STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	58000.	.10	0.	1500.	104321.

EQUIPMENT NUMBER 19

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
TWO WIRE S	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	47000.	.10	0.	1500.	84536.

EQUIPMENT NUMBER 22

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
ONE WAT ST	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	44000.	.10	0.	1500.	79140.

EQUIPMENT NUMBER 23

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
VEH PS STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	43000.	.10	0.	1500.	77341.

EQUIPMENT NUMBER 25

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
PA CHA STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	45000.	.10	0.	1500.	80939.

EQUIPMENT NUMBER 26

NAME	DEVELOPMENT	USEFUL LIFE	COMMON ABOVE	NOT ALLOWED BELOW	FOR REPAIR ONLY
AMP BD STA	0.	15	DEP	DEP	NO

PARAMETERS BY ECHELON

ECHELON	UNIT COST	MAINTENANCE FACTOR	INSTALLATION	AVAILABLE TEST HOURS	PRESENT VALUE
DEP	45000.	.10	0.	1500.	80[illegible].

COMPONENT INFORMATION

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
1	1	1000	RT	5163.	10.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	56.	0.	.00	0.	1

EQ/REP NUM	TIME USED
1	.50

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
2	2	2000	PWER AMP	1008.	9.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	43200.	.00	43200.	2

EQ/REP NUM	TIME USED
4	1.00
2	.50

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
3	3	3000	ECCM	868.	.75	1	NO	.050	.10	1.	3.	30.	120.	2

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	893000.	.00	893000.	2

EQ/REP NUM	TIME USED
4	1.00
3	.50

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
2	STE	1.25	.25	0.	87000.	.00	87000.	3

EQ/REP NUM	TIME USED
4	1.00
5	.06
6	.25

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
4	4	5000	VEH MOUNT	1960.	42.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	56.	0.	.00	0.	1

EQ/REP NUM	TIME USED
1	.50

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT
5	5	6000	IVRCU	840.	3.50	1	NO	.010	.10	1.	3.	30.	120.	1

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALT1	.50	.00	56.	0.	.00	0.	1

PSEUDO COMPONENTS

REF NUM	COMP NUM	COMP ID	COMPONENT NAME	AVERAGE PRICE	WEIGHT	ESS	FALSE REMOVAL	TOTAL PARTS	NEW PARTS	MTBF	FAILURES PER YEAR
6	6	7000	MAN ANT	76.	.80	1	.10	1	1	14752.	.495E-01
7	7	8000	VEN ANT	112.	2.43	1	.10	3	3	2726.	.268E+00
8	8	9000	BAT CASE	115.	1.50	1	.10	1	1	18440.	.396E-01

THERE ARE 8 COMPONENTS

MODULE INFORMATION

```
                                                                                       TAT           NUM    NUM OF     PARTS COST
REF MOD   MOD   MODULE        UNIT     WEIGHT  ESS  HAS   WASH    FALSE                              ALT    NEW PARTS  PER REPAIR
NUM NUM   ID    NAME          PRICE                 NSN           REMOVAL    ORG  DSU  GSU  DEP
 9   1   1001  CHASIS         1409.     5.00    1    NO   .050      .10       1.   3.   30. 120.    2        96.        25.00

      ALT#   NAME     MTTR  DIAG TIME    PAGES       TPS DEV     TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       1     ALT1     1.50     .50          0.        233700.       .00       233700.          2

             EQ/REP NUM     TIME USED
                 4             1.00
                 3              .50

      ALT#   NAME     MTTR  DIAG TIME    PAGES       TPS DEV     TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       2     STE      1.25     .25          0.         54000.       .00        54000.          3

             EQ/REP NUM     TIME USED
                 4             1.00
                 5              .06
                 6              .25

                                                                                       TAT           NUM    NUM OF     PARTS COST
REF MOD   MOD   MODULE        UNIT     WEIGHT  ESS  HAS   WASH    FALSE                              ALT    NEW PARTS  PER REPAIR
NUM NUM   ID    NAME          PRICE                 NSN           REMOVAL    ORG  DSU  GSU  DEP
10   2   1002  CONTROL         382.      .42    1    NO   .050      .10       1.   3.   30. 120.    2        14.        25.00

      ALT#   NAME     MTTR  DIAG TIME    PAGES       TPS DEV     TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       1     ATE      1.50     .50          0.        478200.       .00       478200.          2

             EQ/REP NUM     TIME USED
                 4             1.00
                 3              .50

      ALT#   NAME     MTTR  DIAG TIME    PAGES       TPS DEV     TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       2     STE      1.25     .25          0.         90000.       .00        90000.          3

             EQ/REP NUM     TIME USED
                 4             1.00
                 5              .06
                 6              .25

                                                                                       TAT           NUM    NUM OF     PARTS COST
REF MOD   MOD   MODULE        UNIT     WEIGHT  ESS  HAS   WASH    FALSE                              ALT    NEW PARTS  PER REPAIR
NUM NUM   ID    NAME          PRICE                 NSN           REMOVAL    ORG  DSU  GSU  DEP
11   3   1003  PWR ASSY        190.      .42    1    NO   .050      .10       1.   3.   30. 120.    2        13.        25.00

      ALT#   NAME     MTTR  DIAG TIME    PAGES       TPS DEV     TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       1     ATE      1.50     .50          0.         66300.       .00        66300.          2

             EQ/REP NUM     TIME USED
                 4             1.00
                 2              .50

      ALT#   NAME     MTTR  DIAG TIME    PAGES       TPS DEV     TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       2     STE      1.25     .25          0.         51000.       .00        51000.          2

             EQ/REP NUM     TIME USED
                 4             1.00
                13              .25

                                                                                       TAT           NUM    NUM OF     PARTS COST
REF MOD   MOD   MODULE        UNIT     WEIGHT  ESS  HAS   WASH    FALSE                                                  PER REPAIR
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12   4  1004  TUNER/MIX         394.       .42   1    NO   .050     .10       1.   3.  30. 120.    2         28.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES         TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
          1     ATE       1.50     .50          0.          57900.         .00       57900.              2

                EQ/REP NUM     TIME USED
                     4            1.00
                     2             .50

        ALT#    NAME      MTTR  DIAG TIME    PAGES         TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
          2     STE       1.25     .25          0.          52500.         .00       52500.              2

                EQ/REP NUM     TIME USED
                     4            1.00
                    10             .25

REF MOD   MOD     MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE              TAT              NUM    NUM OF       PARTS COST
NUM NUM   ID       NAME         PRICE                  NSN             REMOVAL     ORG  DSU  GSU  DEP    ALT   NEW PARTS     PER REPAIR
 13   5  1005  IF DEMOD          359.       .42   1    NO   .050      .10        1.   3.  30. 120.    2         19.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES         TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
          1     ATE       1.50     .50          0.          50400.         .00       50400.              2

                EQ/REP NUM     TIME USED
                     4            1.00
                     2             .50

        ALT#    NAME      MTTR  DIAG TIME    PAGES         TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
          2     STE       1.25     .25          0.          54000.         .00       54000.              2

                EQ/REP NUM     TIME USED
                     4            1.00
                     9             .25

REF MOD   MOD     MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE              TAT              NUM    NUM OF       PARTS COST
NUM NUM   ID       NAME         PRICE                  NSN             REMOVAL     ORG  DSU  GSU  DEP    ALT   NEW PARTS     PER REPAIR
 14   6  1006  EXCITER           965.       .42   1    NO   .050      .10        1.   3.  30. 120.    2         80.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES         TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
          1     ATE       1.50     .50          0.         201300.         .00      201300.              2

                EQ/REP NUM     TIME USED
                     4            1.00
                     2             .50

        ALT#    NAME      MTTR  DIAG TIME    PAGES         TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
          2     STE       1.25     .25          0.          87000.         .00       87000.              2

                EQ/REP NUM     TIME USED
                     4            1.00
                    12             .25

REF MOD   MOD     MODULE        UNIT     WEIGHT   ESS  HAS    WASH     FALSE              TAT              NUM    NUM OF       PARTS COST
NUM NUM   ID       NAME         PRICE                  NSN             REMOVAL     ORG  DSU  GSU  DEP    ALT   NEW PARTS     PER REPAIR
 15   7  1007  SYNTHESIS         540.       .42   1    NO   .050      .10        1.   3.  30. 120.    2         32.          25.00

        ALT#    NAME      MTTR  DIAG TIME    PAGES         TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
          1     ATE       1.50     .50          0.         118200.         .00      118200.              2

                EQ/REP NUM     TIME USED
                     4            1.00
                     2             .50
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ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
2	STE	1.25	.25	0.	63000.	.00	63000.	2

EQ/REP NUM	TIME USED
4	1.00
11	.25

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
16	8	1008	TWO-WIRE	171.	.42	1	NO	.050	.10	1.	3.	30.	120.	2	15.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	60900.	.00	60900.	2

EQ/REP NUM	TIME USED
4	1.00
2	.50

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
2	STE	1.25	.25	0.	47500.	.00	47500.	2

EQ/REP NUM	TIME USED
4	1.00
19	.25

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
17	9	1009	SW ASSY	406.	.42	1	NO	.050	.10	1.	3.	30.	120.	2	19.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	324000.	.00	324000.	2

EQ/REP NUM	TIME USED
4	1.00
2	.50

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
2	STE	1.25	.25	0.	69000.	.00	69000.	2

EQ/REP NUM	TIME USED
4	1.00
15	.25

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
18	10	1010	REMOTE I/O	243.	.42	1	NO	.050	.10	1.	3.	30.	120.	2	4.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	366900.	.00	366900.	2

EQ/REP NUM	TIME USED
4	1.00
3	.50

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
2	STE	1.25	.25	0.	69000.	.00	69000.	3

EQ/REP NUM	TIME USED
4	1.00
5	.06
6	.25

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REF MOD  MOD    MODULE       UNIT    WEIGHT  ESS  HAS   WASH    FALSE            TAT           NUM    NUM OF     PARTS COST
NUM NUM  ID      NAME        PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS   PER REPAIR
 19  11  1011  CON MATCH      185.     .42    1    NO   .050     .10      1.   3.   30. 120.    2       17.          25.00

      ALT#   NAME    MTTR  DIAG TIME    PAGES        TPS DEV    TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
       1     ATE     1.50     .50          0.         77100.       .00      77100.              2

             EQ/REP NUM    TIME USED
                 4           1.00
                 2            .50

      ALT#   NAME    MTTR  DIAG TIME    PAGES        TPS DEV    TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
       2     STE     1.25     .25          0.         51000.       .00      51000.              2

             EQ/REP NUM    TIME USED
                 4           1.00
                 7            .25

REF MOD  MOD    MODULE       UNIT    WEIGHT  ESS  HAS   WASH    FALSE            TAT           NUM    NUM OF     PARTS COST
NUM NUM  ID      NAME        PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS   PER REPAIR
 20  12  1012  AUD PS         223.     .42    1    NO   .050     .10      1.   3.   30. 120.    2        7.          25.00

      ALT#   NAME    MTTR  DIAG TIME    PAGES        TPS DEV    TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
       1     ATE     1.50     .50          0.         46800.       .00      46800.              2

             EQ/REP NUM    TIME USED
                 4           1.00
                 2            .50

      ALT#   NAME    MTTR  DIAG TIME    PAGES        TPS DEV    TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
       2     STE     1.25     .25          0.         63000.       .00      63000.              2

             EQ/REP NUM    TIME USED
                 4           1.00
                18            .25

REF MOD  MOD    MODULE       UNIT    WEIGHT  ESS  HAS   WASH    FALSE            TAT           NUM    NUM OF     PARTS COST
NUM NUM  ID      NAME        PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS   PER REPAIR
 21  13  1013  AUD I/O        271.     .42    1    NO   .050     .10      1.   3.   30. 120.    2       10.          25.00

      ALT#   NAME    MTTR  DIAG TIME    PAGES        TPS DEV    TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
       1     ATE     1.50     .50          0.         51900.       .00      51900.              2

             EQ/REP NUM    TIME USED
                 4           1.00
                 2            .50

      ALT#   NAME    MTTR  DIAG TIME    PAGES        TPS DEV    TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
       2     STE     1.25     .25          0.         45000.       .00      45000.              2

             EQ/REP NUM    TIME USED
                 4           1.00
                16            .25

REF MOD  MOD    MODULE       UNIT    WEIGHT  ESS  HAS   WASH    FALSE            TAT           NUM    NUM OF     PARTS COST
NUM NUM  ID      NAME        PRICE                NSN          REMOVAL   ORG  DSU  GSU  DEP    ALT   NEW PARTS   PER REPAIR
 22  14  1014  AUD CON        198.     .42    1    NO   .050     .10      1.   3.   30. 120.    2        7.          25.00

      ALT#   NAME    MTTR  DIAG TIME    PAGES        TPS DEV    TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
       1     ATE     1.50     .50          0.        135900.       .00     135900.              2

             EQ/REP NUM    TIME USED
                 4           1.00
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               4              1.00
               3               .50

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV      TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
        2    STE      1.25     .25         0.        60000.          .00      60000.              2

             EQ/REP NUM    TIME USED
                 4            1.00
                17             .25

 REF MOD   MOD    MODULE        UNIT    WEIGHT   ESS  HAS    WASH     FALSE              TAT             NUM    NUM OF       PARTS COST
 NUM NUM   ID      NAME         PRICE                 NSN             REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS     PER REPAIR
  23  15  2001  CHAS FILT        658.     6.00    1    NO    .050       .10       1.   3.   30.  120.     2       10.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV      TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
        1    ATE      1.50     .50         0.        51600.          .00      51600.              2

             EQ/REP NUM    TIME USED
                 4            1.00
                 2             .50

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV      TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
        2    STE      1.25     .25         0.        45000.          .00      45000.              2

             EQ/REP NUM    TIME USED
                 4            1.00
                25             .25

 REF MOD   MOD    MODULE        UNIT    WEIGHT   ESS  HAS    WASH     FALSE              TAT             NUM    NUM OF       PARTS COST
 NUM NUM   ID      NAME         PRICE                 NSN             REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS     PER REPAIR
  24  16  2002  AMP BD           333.     1.75    1    NO    .050       .10       1.   3.   30.  120.     2       12.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV      TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
        1    ATE      1.50     .50         0.        39000.          .00      39000.              2

             EQ/REP NUM    TIME USED
                 4            1.00
                 2             .50

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV      TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
        2    STE      1.25     .25         0.        45000.          .00      45000.              2

             EQ/REP NUM    TIME USED
                 4            1.00
                26             .25

 REF MOD   MOD    MODULE        UNIT    WEIGHT   ESS  HAS    WASH     FALSE              TAT             NUM    NUM OF       PARTS COST
 NUM NUM   ID      NAME         PRICE                 NSN             REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS     PER REPAIR
  25  17  2003  DECODER          168.     1.75    1    NO    .050       .10       1.   3.   30.  120.     1        1.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV      TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
        1    ATE      1.50     .50         0.        43800.          .00      43800.              2

             EQ/REP NUM    TIME USED
                 4            1.00
                 2             .50

 REF MOD   MOD    MODULE        UNIT    WEIGHT   ESS  HAS    WASH     FALSE              TAT             NUM    NUM OF       PARTS COST
 NUM NUM   ID      NAME         PRICE                 NSN             REMOVAL     ORG  DSU  GSU  DEP     ALT   NEW PARTS     PER REPAIR
  26  18  5001  ONE-WATT         496.     5.00    1    NO    .050       .10       1.   3.   30.  120.     2       19.           25.00

      ALT#   NAME     MTTR  DIAG TIME   PAGES       TPS DEV      TPS MAINT   TPS PV      NUMBER OF EQUIP/REP
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         EQ/REP NUM     TIME USED
              4            1.00
              2             .50

     ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       2     STE       1.25     .25          0.         58500.         .00       58500.              2

         EQ/REP NUM     TIME USED
              4            1.00
             22             .25

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS   WASH     FALSE           TAT            NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN          REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 27  19  5002  PWR SUPP         406.      1.50   1    NO   .050     .10       1.   3.   30. 120.    2        22.          25.00

     ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       1     ATE       1.50     .50          0.         58200.         .00       58200.              2

         EQ/REP NUM     TIME USED
              4            1.00
              2             .50

     ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       2     STE       1.25     .25          0.         47400.         .00       47400.              2

         EQ/REP NUM     TIME USED
              4            1.00
             23             .25

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS   WASH     FALSE           TAT            NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN          REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 28  20  5003  PA CHASIS        941.     26.00   1    NO   .050     .10       1.   3.   30. 120.    2        80.          25.00

     ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       1     ATE       1.50     .50          0.        106500.         .00      106500.              2

         EQ/REP NUM     TIME USED
              4            1.00
              3             .50

     ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       2     STE       1.25     .25          0.         35000.         .00       35000.              3

         EQ/REP NUM     TIME USED
              4            1.00
              5             .06
              6             .25

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS   WASH     FALSE           TAT            NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN          REMOVAL    ORG  DSU  GSU  DEP    ALT   NEW PARTS    PER REPAIR
 29  21  6001  ANALOG           153.       .38   1    NO   .050     .10       1.   3.   30. 120.    1         5.          25.00

     ALT#    NAME      MTTR  DIAG TIME    PAGES        TPS DEV      TPS MAINT    TPS PV      NUMBER OF EQUIP/REP
       1     ATE       1.50     .50          0.         49500.         .00       49500.              2

         EQ/REP NUM     TIME USED
              4            1.00
              2             .50

REF MOD   MOD     MODULE       UNIT    WEIGHT   ESS  HAS   WASH     FALSE           TAT            NUM    NUM OF      PARTS COST
NUM NUM    ID      NAME        PRICE                 NSN          REMOVAL                          ALT   NEW PARTS    PER REPAIR
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REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
30	22	6002	IVRCU PS	91.	.38	1	NO	.050	.10	1.	3.	30.	120.	1	8.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	49200.	.00	49200.	2

EQ/REP NUM	TIME USED
4	1.00
2	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
31	23	6003	DECOD/TIM	120.	.38	1	NO	.050	.10	1.	3.	30.	120.	1	2.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	157800.	.00	157800.	2

EQ/REP NUM	TIME USED
4	1.00
1	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
32	24	6004	MICRO	185.	.38	1	NO	.050	.10	1.	3.	30.	120.	1	2.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	236700.	.00	236700.	2

EQ/REP NUM	TIME USED
4	1.00
1	.50

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
33	25	6005	IVRCU CHAS	417.	2.00	1	NO	.050	.10	1.	3.	30.	120.	2	25.	25.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ATE	1.50	.50	0.	106500.	.00	106500.	2

EQ/REP NUM	TIME USED
4	1.00
3	.50

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
2	STE	1.25	.25	0.	45000.	.00	45000.	3

EQ/REP NUM	TIME USED
4	1.00
5	.06
6	.25

REF NUM	MOD NUM	MOD ID	MODULE NAME	UNIT PRICE	WEIGHT	ESS	HAS NSN	WASH	FALSE REMOVAL	TAT ORG	TAT DSU	TAT GSU	TAT DEP	NUM ALT	NUM OF NEW PARTS	PARTS COST PER REPAIR
34	26	5004	MTG TRAT	411.	10.00	1	NO	.250	.10	1.	3.	30.	120.	1	21.	17.00

ALT#	NAME	MTTR	DIAG TIME	PAGES	TPS DEV	TPS MAINT	TPS PV	NUMBER OF EQUIP/REP
1	ALTI	.50	.00	5.	0.	.00	0.	0

PSEUDO MODULES

REF NUM	MOD NUM	MOD ID	MODULE NAME	AVERAGE PRICE	WEIGHT	ESS	FALSE REMOVAL	TOTAL PARTS	NEW PARTS
35	27	3001	ECCM PTS	25.	.25	1	.10	55	22

THERE ARE 27 MODULES

APPLICATIONS

REF NUM	APP NUM	COMP NUM	MOD NUM	COMP ID	MOD ID	COMPONENT NAME	MODULE NAME	MTBF	FAILURES PER YEAR	ADD REP ALT
37	1	1	1	1000	1001	RT	CHASIS	14007.	.521E-01	0
38	2	1	2	1000	1002	RT	CONTROL	27863.	.262E-01	0
39	3	1	3	1000	1003	RT	PWR ASSY	25974.	.281E-01	0
40	4	1	4	1000	1004	RT	TUNER/MIX	12943.	.564E-01	0
41	5	1	5	1000	1005	RT	IF DEMOD	18861.	.387E-01	0
42	6	1	6	1000	1006	RT	EXCITER	11741.	.622E-01	0
43	7	1	7	1000	1007	RT	SYNTHESIS	15686.	.465E-01	0
44	8	1	8	1000	1008	RT	TWO-WIRE	22650.	.322E-01	0
45	9	1	9	1000	1009	RT	SW ASSY	12840.	.569E-01	0
46	10	1	10	1000	1010	RT	REMOTE I/O	44405.	.164E-01	0
47	11	1	11	1000	1011	RT	CON MATCH	28818.	.253E-01	0
48	12	1	12	1000	1012	RT	AUD PS	32541.	.224E-01	0
49	13	1	13	1000	1013	RT	AUD I/O	14892.	.490E-01	0
50	14	1	14	1000	1014	RT	AUD CON	21968.	.332E-01	0
51	15	2	15	2000	2001	PWER AMP	CHAS FILT	58850.	.124E-01	0
52	16	2	16	2000	2002	PWER AMP	AMP BD	92326.	.791E-02	0
53	17	2	17	2000	2003	PWER AMP	DECODER	120522.	.606E-02	0
54	18	3	27	3000	3001	ECCM	ECCM PTS	12472.	.585E-01	0
55	19	4	18	5000	5001	VEH MOUNT	ONE-WATT	14350.	.509E-01	0
56	20	4	19	5000	5002	VEH MOUNT	PWR SUPP	30286.	.241E-01	0
57	21	4	20	5000	5003	VEH MOUNT	PA CHASIS	72195.	.101E-01	0
58	22	5	21	6000	6001	IVRCU	ANALOG	151371.	.482E-02	0
59	23	5	22	6000	6002	IVRCU	IVRCU PS	219843.	.332E-02	0
60	24	5	23	6000	6003	IVRCU	DECOD/TIM	291099.	.251E-02	0
61	25	5	24	6000	6004	IVRCU	MICRO	205617.	.355E-02	0
62	26	5	25	6000	6005	IVRCU	IVRCU CHAS	178200.	.410E-02	0
63	27	4	26	5000	5004	VEH MOUNT	MTG TRAT	2273457.	.321E-03	0

THERE ARE 27 APPLICATIONS

THERE ARE 1.09 END ITEM FAILURES PER YEAR
THE DERIVED MTBF IS 669. HOURS
THE INPUT MTBF IS 700. HOURS

APEX WORKED FINE. SOLUTION OPTIMALITY WITHIN .03 PER CENT OF IDEAL

MAINTENANCE POLICIES BY APPLICATION

APP NUM	COMPONENT NAME	MODULE NAME	REPAIR LEVEL EI	COMP	MOD	FRACTION OF TIME	MODULE PROMOTED	SENSITIVITY FLAG
1	RT	CHASIS	ORG	DSU	GSU	1.000		
2	RT	CONTROL	ORG	DSU	TOSS	1.000		
3	RT	PWR ASSY	ORG	DSU	TOSS	1.000		
4	RT	TUNER/MIX	ORG	DSU	DEP	1.000		
5	RT	IF DEMOD	ORG	DSU	DEP	1.000		
6	RT	EXCITER	ORG	DSU	DEP	1.000		
7	RT	SYNTHESIS	ORG	DSU	DEP	1.000		
8	RT	TWO-WIRE	ORG	DSU	TOSS	1.000		
9	RT	SW ASSY	ORG	DSU	DEP	1.000		
10	RT	REMOTE I/O	ORG	DSU	TOSS	1.000		
11	RT	CON MATCH	ORG	DSU	TOSS	1.000		
12	RT	AUD PS	ORG	DSU	TOSS	1.000		
13	RT	AUD I/O	ORG	DSU	DEP	1.000		
14	RT	AUD CON	ORG	DSU	TOSS	1.000		
15	PWER AMP	CHAS FILT	ORG	GSU	DEP	1.000		
16	PWER AMP	AMP BD	ORG	GSU	TOSS	1.000		
17	PWER AMP	DECODER	ORG	GSU	TOSS	1.000		
18	ECCM	ECCM PTS	ORG	GSU	TOSS	1.000		
19	VEH MOUNT	ONE-WATT	ORG	DSU	DEP	1.000		
20	VEH MOUNT	PWR SUPP	ORG	DSU	DEP	1.000		
21	VEH MOUNT	PA CHASIS	ORG	DSU	TOSS	1.000		
22	IVRCU	ANALOG	ORG	DSU	TOSS	1.000		
23	IVRCU	IVRCU PS	ORG	DSU	TOSS	1.000		
24	IVRCU	DECOD/TIM	ORG	DSU	TOSS	1.000		
25	IVRCU	MICRO	ORG	DSU	TOSS	1.000		
26	IVRCU	IVRCU CHAS	ORG	DSU	TOSS	1.000		
27	VEH MOUNT	MTG TRAT	ORG	DSU	TOSS	1.000		
28	MAN ANT	NONE	ORG	TOSS		1.000		
29	VEN ANT	NONE	ORG	TOSS		1.000		
30	BAT CASE	NONE	ORG	TOSS		1.000		

REF NO	WHEN (X)	NAME		REPAIRED AT		BY REMOVE AND REPLACE OF			USE REPAIR ALTERNATIVE		THIS FRAC OF THE TIME	SENSITIVITY FLAG
1	X= EI			1	ORG	COMP	1	RT	1	ONAM	1.0000	
2	X= EI			1	ORG	COMP	2	PWER AMP	1	ONAM	1.0000	
3	X= EI			1	ORG	COMP	3	ECCM	1	ONAM	1.0000	
4	X= EI			1	ORG	COMP	4	VEH MOUNT	1	ONAM	1.0000	
5	X= EI			1	ORG	COMP	5	IVRCU	1	ONAM	1.0000	
6	X= EI			1	ORG	COMP	6	MAN ANT	1	ONAM	1.0000	
7	X= EI			1	ORG	COMP	7	VEN ANT	1	ONAM	1.0000	
8	X= EI			1	ORG	COMP	8	BAT CASE	1	ONAM	1.0000	
9	X= MOD	1	CHASIS	3	GSU			PARTS	1	ALTI	1.0000	
12	X= MOD	4	TUNER/MIX	4	DEP			PARTS	1	ATE	1.0000	
13	X= MOD	5	IF DEMOD	4	DEP			PARTS	1	ATE	1.0000	
14	X= MOD	6	EXCITER	4	DEP			PARTS	1	ATE	1.0000	
15	X= MOD	7	SYNTHESIS	4	DEP			PARTS	1	ATE	1.0000	
17	X= MOD	9	SW ASSY	4	DEP			PARTS	2	STE	1.0000	
21	X= MOD	13	AUD I/O	4	DEP			PARTS	1	ATE	1.0000	
23	X= MOD	15	CHAS FILT	4	DEP			PARTS	1	ATE	1.0000	
26	X= MOD	18	ONE-WATT	4	DEP			PARTS	1	ATE	1.0000	
27	X= MOD	19	PWR SUPP	4	DEP			PARTS	1	ATE	1.0000	
37	X= COMP	1	RT	2	DSU	MOD	1	CHASIS	1	ALTI	1.0000	
38	X= COMP	1	RT	2	DSU	MOD	2	CONTROL	1	ALTI	1.0000	
39	X= COMP	1	RT	2	DSU	MOD	3	PWR ASSY	1	ALTI	1.0000	
40	X= COMP	1	RT	2	DSU	MOD	4	TUNER/MIX	1	ALTI	1.0000	
41	X= COMP	1	RT	2	DSU	MOD	5	IF DEMOD	1	ALTI	1.0000	
42	X= COMP	1	RT	2	DSU	MOD	6	EXCITER	1	ALTI	1.0000	
43	X= COMP	1	RT	2	DSU	MOD	7	SYNTHESIS	1	ALTI		

44	X= COMP	1	RT	2 DSU	MOD	8	TWO-WIRE	1	ALTI	1.0000
45	X= COMP	1	RT	2 DSU	MOD	9	SW ASSY	1	ALTI	1.0000
46	X= COMP	1	RT	2 DSU	MOD	10	REMOTE I/O	1	ALTI	1.0000
47	X= COMP	1	RT	2 DSU	MOD	11	CON MATCH	1	ALTI	1.0000
48	X= COMP	1	RT	2 DSU	MOD	12	AUD PS	1	ALTI	1.0000
49	X= COMP	1	RT	2 DSU	MOD	13	AUD I/O	1	ALTI	1.0000
50	X= COMP	1	RT	2 DSU	MOD	14	AUD CON	1	ALTI	1.0000
51	X= COMP	2	PWER AMP	3 GSU	MOD	15	CHAS FILT	1	ATE	1.0000
52	X= COMP	2	PWER AMP	3 GSU	MOD	16	AMP HD	1	ATE	1.0000
53	X= COMP	2	PWER AMP	3 GSU	MOD	17	DECODER	1	ATE	1.0000
54	X= COMP	3	ECCM	3 GSU	MOD	27	ECCM PTS	1	ATE	1.0000
55	X= COMP	4	VEH MOUNT	2 DSU	MOD	18	ONE-WATT	1	ALTI	1.0000
56	X= COMP	4	VEH MOUNT	2 DSU	MOD	19	PWR SUPP	1	ALTI	1.0000
57	X= COMP	4	VEH MOUNT	2 DSU	MOD	20	PA CHASIS	1	ALTI	1.0000
58	X= COMP	5	IVRCU	2 DSU	MOD	21	ANALOG	1	ALTI	1.0000
59	X= COMP	5	IVRCU	2 DSU	MOD	22	IVRCU PS	1	ALTI	1.0000
60	X= COMP	5	IVRCU	2 DSU	MOD	23	DECOD/TIM	1	ALTI	1.0000
61	X= COMP	5	IVRCU	2 DSU	MOD	24	MICRO	1	ALTI	1.0000
62	X= COMP	5	IVRCU	2 DSU	MOD	25	IVRCU CHAS	1	ALTI	1.0000
63	X= COMP	4	VEH MOUNT	2 DSU	MOD	26	MTG TRAT	1	ALTI	1.0000

SPECIAL TEST EQUIPMENT/REPAIRMAN REQUIREMENTS

PECULIAR EQUIPMENT/REPAIRMAN

EQUIP NUM	EQUIPMENT NAME	ECHELON	REQUIREMENT PER SHOP	QUANTITY PER SHOP	TOT QTY AT ECH	HARDWR CST (TOTAL PV)	DEVELOPMENT COST	ACCUMULATING QTY OF THIS EQUIPMENT UP ECHELONS
15	SWITCH STA	DEP	.020	1	1	97126.	0.	1

TOTAL PRESENT VALUE OF PECULIAR SPECIAL TEST EQUIPMENT/REPAIRMEN(INC. DEVPMT COST) = 97126.

SPECIAL TEST EQUIPMENT/REPAIRMEN COMMON AT HIGHER ECHELONS

EQUIP NUM	EQUIPMENT NAME	ECHELON	REQUIREMENT PER SHOP	QUANTITY PER SHOP	TOT QTY AT ECH	HARDWR CST (TOTAL PV)	DEVELOPMENT COST	ACCUMULATING QTY OF THIS EQUIPMENT UP ECHELONS
1	COMMON EQ	DSU	.004	.004	.40	44181.	0.	.40
2	USM-410	GSU	.001	.001	.02	61559.	0.	.02
2	USM-410	DEP	.247	.247	.25	508678.	0.	.27
3	USM-465	GSU	.003	.003	.08	10313.	0.	.08
4	REP VAN	GSU	.008	.008	.19	66815.	0.	.19
4	REP VAN	DEP	.548	.548	.55	29555.	0.	.74

TOTAL PRESENT VALUE OF EQUIPMENT/REPAIRMEN WHERE COMMON = 721101.

TOTAL PRESENT VALUE OF SPECIAL TEST EQUIPMENT/REPAIRMEN REQUIRED = 818228.

LOGISTICS COSTS
LOGISTICS COSTS FOR COMPONENTS (PRESENT VALUE).

COMP NUM	COMPONENT NAME	INITIAL SPARES($)	CONSUMP. SPARES($)	LABOR COST	TPS COST	OTHER COST	TOTAL COST
1	RT	635,049.	544,607.	99,353.	0.	497,030.	1,776,039.
2	PWER AMP	50,400.	5,137.	20,995.	43,200.	52,466.	172,198.
3	FCCM	139,748.	49,096.	45,393.	893,000.	153,541.	1,280,777.
4	VEH MOUNT	205,800.	32,353.	15,547.	0.	171,147.	424,847.
5	IVRCU	85,680.	2,971.	3,331.	0.	98,648.	190,630.
6	MAN ANT	25,004.	72,686.	0.	0.	139,861.	237,551.
7	VEN ANT	190,848.	579,670.	0.	0.	626,193.	1,396,711.
8	RAT CASE	31,050.	87,988.	0.	0.	128,196.	247,235.
COMPONENT COLUMN TOTALS:		1,363,579.	1,374,508.	184,619.	936,200.	1,867,082.	5,725,988.

LOGISTICS COSTS FOR MODULES (PRESENT VALUE).

MOD NUM	MODULE NAME	INITIAL SPARES($)	CONSUMP. SPARES($)	LABOR COST	TPS COST	PARTS COST	OTHER COST	TOTAL COST
1	CHASIS	118,356.	70,252.	40,014.	233,700.	103,351.	241,164.	806,837.
2	CONTROL	46,222.	191,496.	0.	0.	0.	49,544.	287,261.
3	PWR ASSY	28,880.	102,174.	0.	0.	0.	47,143.	178,196.
4	TUNER/MIX	84,710.	21,260.	43,304.	57,900.	58,783.	187,668.	453,624.
5	IF DEMOD	40,208.	13,293.	29,716.	50,400.	40,085.	94,143.	267,844.
6	EXCITER	141,855.	57,401.	47,737.	201,300.	98,183.	249,897.	796,373.
7	SYNTHESIS	66,420.	24,042.	35,731.	118,200.	55,070.	131,063.	430,526.
8	TWO-WIRE	28,557.	105,451.	0.	0.	0.	50,862.	184,870.
9	SW ASSY	86,884.	22,083.	35,648.	69,000.	54,220.	172,448.	440,283.
10	REMOTE I/O	21,141.	76,436.	0.	0.	0.	34,550.	132,127.
11	CON MATCH	26,270.	89,667.	0.	0.	0.	43,964.	159,901.
12	AUD PS	24,084.	95,719.	0.	0.	0.	40,773.	160,575.
13	AUD I/O	55,013.	12,709.	37,636.	51,900.	40,934.	141,355.	339,547.
14	AUD CON	33,660.	125,892.	0.	0.	0.	53,006.	212,558.
15	CHAS FILT	12,502.	7,809.	9,524.	51,600.	15,618.	32,385.	129,437.
16	AMP BD	10,656.	50,378.	0.	0.	0.	8,773.	69,807.
17	DECODER	4,200.	19,470.	0.	0.	0.	6,309.	29,979.
18	ONE-WATT	52,576.	24,139.	39,058.	45,000.	49,146.	120,114.	330,033.
19	PWR SUPP	26,390.	9,362.	18,506.	58,200.	31,547.	83,930.	227,936.
20	PA CHASIS	37,640.	182,056.	0.	0.	0.	27,107.	246,804.
21	ANALOG	3,060.	14,118.	0.	0.	0.	7,466.	24,644.
22	IVRCU PS	1,365.	5,782.	0.	0.	0.	5,678.	12,825.
23	DECOD/TIM	1,320.	5,758.	0.	0.	0.	4,920.	11,998.
24	MICRO	2,775.	12,567.	0.	0.	0.	6,228.	21,570.
25	IVRCU CHAS	7,506.	32,685.	0.	0.	0.	8,030.	48,221.
26	MTG TRAT	822.	2,525.	0.	0.	0.	2,868.	6,215.
27	ECCM PTS	6,875.	26,867.	0.	0.	0.	94,664.	128,406.
MODULE COLUMN TOTALS:		969,947.	1,401,391.	336,874.	937,200.	546,937.	1,946,052.	6,138,397.

MTD & RTD & TURN AROUND TIME

COMPONENT NUMBER	COMPONENT NAME	WASH	MTD				RTD				TAT(INC SRU WAIT)			
			ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP
1	RT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	35.6	30.0	120.0
2	PWER AMP	.010	.000	.000	.990	.000	1.000	.000	.000	.000	1.0	3.0	76.2	120.0
3	ECCM	.050	.000	.000	.950	.000	1.000	.000	.000	.000	1.0	3.0	103.8	120.0
4	VEH MOUNT	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	56.7	30.0	120.0
5	IVRCU	.010	.000	.990	.000	.000	1.000	.000	.000	.000	1.0	96.2	30.0	120.0
6	MAN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
7	VEN ANT	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0
8	BAT CASE	1.000	.000	.000	.000	.000	1.000	.000	.000	.000	.0	.0	.0	.0

MTD & RTD & TURN AROUND TIME

MODULE	MODULE	WASH	MTD				RTD				TAT INC WAIT			
NUMBER	NAME		ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP	ORG	DSU	GSU	DEP
1	CHASIS	.050	.000	.000	.950	.000	.000	1.000	.000	.000	1.0	3.0	111.2	120.0
2	CONTROL	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
3	PWR ASSY	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
4	TUNER/MIX	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	124.4
5	IF DEMOD	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	124.7
6	EXCITER	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	123.9
7	SYNTHESIS	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	123.6
8	TWO-WIRE	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
9	SW ASSY	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	121.9
10	REMOTE I/O	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
11	CON MATCH	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
12	AUD PS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
13	AUD I/O	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	123.7
14	AUD CON	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
15	CHAS FILT	.050	.000	.000	.000	.950	.000	.000	1.000	.000	1.0	3.0	30.0	124.0
16	AMP BD	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	1.0	3.0	30.0	120.0
17	DECODER	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	1.0	3.0	30.0	120.0
18	ONE-WATT	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	123.2
19	PWR SUPP	.050	.000	.000	.000	.950	.000	1.000	.000	.000	1.0	3.0	30.0	125.9
20	PA CHASIS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
21	ANALOG	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
22	IVRCU PS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
23	DECOD/TIM	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
24	MICRO	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
25	IVRCU CHAS	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
26	MTG TRAT	1.000	.000	.000	.000	.000	.000	1.000	.000	.000	1.0	3.0	30.0	120.0
27	ECCM PTS	1.000	.000	.000	.000	.000	.000	.000	1.000	.000	.0	.0	.0	.0

SESAME OUTPUT FOR COMPONENTS

SPARES

NUMBER	COMPONENT NAME	ALLOWANCES PER CLAIMANT ORG	DSU	GSU	DEPOT	QTY * UP	FAIL PER END ITEM PER YR
1	RT	0.	1.	0.	23.	635,049.	.600
2	PWER AMP	0.	0.	2.	2.	50,400.	.029
3	ECCM	0.	1.	2.	13.	139,748.	.064
4	VEH MOUNT	0.	1.	0.	5.	205,800.	.094
5	IVRCU	0.	1.	0.	2.	85,680.	.020
6	MAN ANT	0.	1.	2.	181.	25,004.	.054
7	VEH ANT	0.	2.	2.	320.	63,616.	.098
8	BAT CASE	0.	1.	1.	146.	31,050.	.044

SESAME OUTPUT FOR MODULES

SPARES

NUMBER	MODULE NAME	ALLOWANCES PER CLAIM. ORG	DSU	GSU	DEPOT	QTY * UP	FAIL PER END ITEM PER YR
1	CHASIS	0.	0.	3.	12.	118,356.	.057
2	CONTROL	0.	0.	1.	97.	46,222.	.029
3	PWR ASSY	0.	0.	2.	104.	28,880.	.031
4	TUNER/MIX	0.	1.	1.	91.	84,710.	.061
5	IF DEMOD	0.	0.	2.	64.	40,208.	.042
6	EXCITER	0.	0.	2.	99.	141,855.	.068
7	SYNTHESIS	0.	0.	2.	75.	66,420.	.051
8	TWO-WIRE	0.	0.	2.	119.	28,557.	.035
9	SW ASSY	0.	1.	1.	90.	86,884.	.062
10	REMOTE I/O	0.	0.	1.	63.	21,141.	.018
11	CON MATCH	0.	0.	2.	94.	26,270.	.028
12	AUD PS	0.	0.	1.	84.	24,084.	.024
13	AUD I/O	0.	1.	1.	79.	55,013.	.053
14	AUD CON	0.	0.	2.	122.	33,660.	.036
15	CHAS FILT	0.	0.	0.	19.	12,502.	.014
16	AMP BD	0.	0.	0.	32.	10,656.	.009
17	DECODER	0.	0.	0.	25.	4,200.	.007
18	ONE-WATT	0.	0.	1.	82.	52,576.	.055
19	PWR SUPP	0.	0.	1.	41.	26,390.	.026
20	PA CHASIS	0.	0.	0.	40.	37,640.	.011
21	ANALOG	0.	0.	0.	20.	3,060.	.005
22	IVRCU PS	0.	0.	0.	15.	1,365.	.004
23	DECOD/TIM	0.	0.	0.	11.	1,320.	.003
24	MICRO	0.	0.	0.	15.	2,775.	.004
25	IVRCU CHAS	0.	0.	0.	18.	7,506.	.004
26	MTG TRAT	0.	0.	0.	2.	822.	.000
27	ECCM PTS	0.	0.	0.	5.	125.	.001

LOGISTICS TOTALS

INITIAL SPARES COST	2,456,176.
CONSUMPTION SPARES (PRESENT VALUE)	2,980,021.
INVENTORY HOLDING COST (PRESENT VALUE)	588,479.
TRANSPORTATION COST (PRESENT VALUE)	90,167.
REQUISITION COST (PRESENT VALUE)	1,504,601.
CATALOGING COST (PRESENT VALUE)	705,774.
BIN COST (PRESENT VALUE)	1,093,877.
REPAIR COST (PRESENT VALUE)	521,494.
SCREENING COST	0.
DOCUMENTATION COST	50,400.
TEST PROGRAM SETS COST	1,873,400.
TOTAL LOGISTICS COST	11,864,388.

TOTAL COST FOR THIS MAINTENANCE CONCEPT IN TERMS OF PRESENT VALUE

TOTAL LOGISTICS COST	11,864,388.
TOTAL TEST EQUIPMENT/REPAIRMAN COST	818,228.
TOTAL	12,682,616.

OPERATIONAL AVAILABILITY ACHIEVED AND CURVE PARAM USED
.9618 8241.7

POLICY FILE

123	1	1.0000
125	2	1.0000
125	3	1.0000
124	4	1.0000
124	5	1.0000
124	6	1.0000
124	7	1.0000
125	8	1.0000
124	9	1.0000
125	10	1.0000
125	11	1.0000
125	12	1.0000
124	13	1.0000
125	14	1.0000
134	15	1.0000
135	16	1.0000
135	17	1.0000
135	18	1.0000
124	19	1.0000
124	20	1.0000
125	21	1.0000
125	22	1.0000
125	23	1.0000
125	24	1.0000
125	25	1.0000
125	26	1.0000
125	27	1.0000
155	28	1.0000
155	29	1.0000
155	30	1.0000
WVA	111	1.0000
WVA	211	1.0000
WVA	311	1.0000
WVA	411	1.0000
WVA	511	1.0000
WVA	611	1.0000
WVA	711	1.0000
WVA	811	1.0000
WVA	931	1.0000
WVA	1241	1.0000
WVA	1341	1.0000
WVA	1441	1.0000
WVA	1541	1.0000
WVA	1742	1.0000
WVA	2141	1.0000
WVA	2341	1.0000
WVA	2641	1.0000
WVA	2741	1.0000
WVA	3721	1.0000
WVA	3821	1.0000
WVA	3921	1.0000
WVA	4021	1.0000
WVA	4121	1.0000
WVA	4221	1.0000
WVA	4321	1.0000
WVA	4421	1.0000
WVA	4521	1.0000
WVA	4621	1.0000
WVA	4721	1.0000
WVA	4821	1.0000
WVA	4921	1.0000
WVA	5021	1.0000
WVA	5131	1.0000
WVA	5231	1.0000
WVA	5331	1.0000
WVA	5431	1.0000

WVA	5521	1.0000
WVA	5621	1.0000
WVA	5721	1.0000
WVA	5821	1.0000
WVA	5921	1.0000
WVA	6021	1.0000
WVA	6121	1.0000
WVA	6221	1.0000
WVA	6321	1.0000

OTHER COST BREAKOUT

OTHER LOGISTICS COSTS FOR COMPONENTS (PRESENT VALUE).

COMP NUM	COMPONENT NAME	HOLDING	TRANSP.	REQ	BIN	CATLOG	DOCUM.
1	RT	152,152.	19,701.	255,855.	50,726.	1,796.	16,800.
2	PWER AMP	12,075.	1,680.	24,359.	12,556.	1,796.	0.
3	FCCM	33,482.	336.	55,147.	62,780.	1,796.	0.
4	VEH MOUNT	49,308.	12,479.	40,038.	50,726.	1,796.	16,800.
5	IVRCU	20,528.	220.	8,578.	50,726.	1,796.	16,800.
6	MAN ANT	5,991.	1,065.	68,229.	62,780.	1,796.	0.
7	VEN ANT	45,726.	17,512.	369,229.	188,340.	5,388.	0.
8	BAT CASE	7,439.	1,598.	54,583.	62,780.	1,796.	0.
COMPONENT COLUMN TOTALS:		326,701.	54,591.	876,018.	541,414.	17,960.	50,400.

OTHER LOGISTICS COSTS FOR MODULES (PRESENT VALUE).

MOD NUM	MODULE NAME	HOLDING	TRANSP.	REQ	BIN	CATLOG	DOCUM.
1	CHASIS	28,357.	1,153.	24,899.	12,556.	174,199.	0.
2	CONTROL	11,074.	276.	23,842.	12,556.	1,796.	0.
3	PWR ASSY	6,919.	296.	25,576.	12,556.	1,796.	0.
4	TUNER/MIX	20,296.	1,188.	51,325.	62,780.	52,080.	0.
5	IF DEMOD	9,633.	815.	35,221.	12,556.	35,917.	0.
6	EXCITER	33,987.	1,309.	56,580.	12,556.	145,465.	0.
7	SYNTHESIS	15,914.	980.	42,350.	12,556.	59,263.	0.
8	TWO-WIRE	6,842.	339.	29,329.	12,556.	1,796.	0.
9	SW ASSY	20,817.	1,197.	51,737.	62,780.	35,917.	0.
10	REMOTE I/O	5,065.	173.	14,960.	12,556.	1,796.	0.
11	CON MATCH	6,294.	267.	23,052.	12,556.	1,796.	0.
12	AUD PS	5,770.	236.	20,414.	12,556.	1,796.	0.
13	AUD I/O	13,181.	1,032.	44,608.	62,780.	19,754.	0.
14	AUD CON	8,065.	350.	30,240.	12,556.	1,796.	0.
15	CHAS FILT	2,995.	3,489.	5,644.	502.	19,754.	0.
16	AMP HD	2,553.	324.	3,598.	502.	1,796.	0.
17	DECODER	1,006.	248.	2,756.	502.	1,796.	0.
18	ONE-WATT	12,597.	12,751.	46,293.	12,556.	35,917.	0.
19	PWR SUPP	6,323.	1,812.	21,934.	12,556.	41,305.	0.
20	PA CHASIS	9,018.	6,590.	9,201.	502.	1,796.	0.
21	ANALOG	733.	46.	4,389.	502.	1,796.	0.
22	TVRCU PS	327.	32.	3,022.	502.	1,796.	0.
23	DECOD/TIM	316.	24.	2,282.	502.	1,796.	0.
24	MICRO	665.	34.	3,231.	502.	1,796.	0.
25	TVRCU CHAS	1,798.	205.	3,728.	502.	1,796.	0.
26	MTG TRAT	197.	80.	292.	502.	1,796.	0.
27	ECCM PTS	1,647.	329.	25,556.	27,623.	39,509.	0.
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MODULE COLUMN TOTALS:		232,389.	35,575.	606,059.	384,211.	687,816.	0.

LOGISTICS COSTS FOR PARTS (PRESENT VALUE).
(PARTS CATALOGING COSTS ARE INCLUDED IN MODULE CATALOGING COSTS)

USED ON MOD. NUM	USED ON MOD. NAME	INITIAL PARTS($)	CONSUMP. PARTS($)	HOLD COST	REQ COST	BIN COST
1	CHASIS	7,200.	23,683.	1,725.	22,528.	48,215.
4	TUNER/MIX	15,400.	25,630.	3,690.	0.	14,063.
5	IF DEMOD	10,450.	17,588.	2,504.	0.	9,543.
6	EXCITER	24,000.	28,254.	5,750.	0.	40,179.
7	SYNTHESIS	14,400.	21,148.	3,450.	0.	16,072.
9	SW ASSY	15,200.	25,836.	3,642.	0.	9,543.
13	AUD I/O	11,000.	22,276.	2,636.	0.	5,022.
15	CHAS FILT	4,000.	5,637.	958.	0.	5,022.
18	ONE-WATT	13,300.	23,117.	3,187.	0.	9,543.
19	PWR SUPP	7,700.	10,953.	1,845.	0.	11,049.
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PART COLUMN TOTALS:		122,650.	204,123.	29,386.	22,528.	168,250.

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AVAIL & CURVE PAR    .9076        1000.
AVAIL & CURVE PAR    .9927      100000.
AVAIL & CURVE PAR    .9780       10000.
AVAIL & CURVE PAR    .9225        3162.
AVAIL & CURVE PAR    .9545        5623.
AVAIL & CURVE PAR    .9577        7499.
AVAIL & CURVE PAR    .9631        8660.
AVAIL & CURVE PAR    .9577        8058.
AVAIL & CURVE PAR    .9618        8354.
AVAIL & CURVE PAR    .9577        8205.
AVAIL & CURVE PAR    .9618        8279.
AVAIL & CURVE PAR    .9618        8242.
AVAIL & CURVE PAR    .9577        8223.
AVAIL & CURVE PAR    .9577        8232.
AVAIL & CURVE PAR    .9618        8242.
AVAIL & CURVE PAR    .9618        8242.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVAIL & CURVE PAR    .0000           0.
AVE WAIT(DAYS) FOR SRU BY ECHELON        .00      37.10      65.01        .00
AVERAGE DOWN TIME (IN DAYS) DUE TO CTDEL IS:     .00
AVE REPAIR COST BY ECHELON        .00  14804.09  13322.94  37170.90

 TO OBTAIN AVG PRODUCTIVE REPAIR HRS AT
ECHELON K. DIVIDE BY EFFECTIVE LABOR RATE AT K
(SEE PREPROCESSOR)
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STOCKAGE LISTS

ORGANIZATION UNIT STOCKAGE LIST

THERE ARE NO ITEMS ON LIST

DIRECT SUPPORT UNIT STOCKAGE LIST

NUM	NAME	TYPE/ESS.		QUANTITY	$ VALUE
1	RT	C	1	1.	5,163.
3	FCCM	C	1	1.	868.
4	VEH MOUNT	C	1	1.	1,960.
5	IVRCU	C	1	1.	840.
6	MAN ANT	C	1	1.	76.
7	VEN ANT	C	1	2.	224.
8	BAT CASE	C	1	1.	115.
4	TUNER/MIX	M	1	1.	394.
9	SW ASSY	M	1	1.	406.
13	AUD I/O	M	1	1.	271.

TOTAL DOLLAR VALUE OF LIST IS: 10,317.

PREFACE

The purpose of this manual is to enable an analyst or engineer to perform level of repair analysis (LORA) using the Optimum Supply and Maintenance Model (OSAMM). It is assumed that users have a working knowledge of the U.S. Army's logistics system and of basic supply and maintenance terminology. The manual describes the input file that must be constructed and the outputs generated by the model. It also contains a discussion of how the model can be used to perform sensitivity analysis. Readers interested in algorithms internal to the model are directed to the theoretical documentation [1]. Since actual execution procedures may change over time, they are not included here but will be provided to users on an as required basis.

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Chapter 1

THE MODEL

1.1 INTRODUCTION

The Optimum Supply and Maintenance Model (OSAMM) is a tool used to conduct level of repair analysis (LORA) for a new equipment entering the field. It helps the analyst or engineer determine at which of the Army maintenance levels (organization, intermediate forward, intermediate rear, or depot) various repair actions should be performed. Another possible "repair level" is no repair. In other words, the item in question is discarded when it fails. For the remainder of this manual the term "repair level" is taken to include the discard at failure option.

The two major factors contributing to the repair level decision are the maintenance and supply requirements. Maintenance requirements include the test equipments and special repairmen that must be deployed to support repair. Supply is concerned with the placement of spares in the field to achieve a readiness objective such as operational availability. These two factors are interrelated and cannot be considered independently when selecting levels of repair. Suppose, for example, that the level of repair was chosen so as to minimize the test equipment required. Since this would mean placing test equipment at the most central location, all repairs would be at the depot. The spares that would be required in the field to achieve an operational availability in this case would be quite extensive. Similarly, if the repair level was chosen to minimize spares, test equipment would have to be distributed to each of the many field maintenance shops. Because of this interdependence, the OSAMM is designed to choose repair levels by simultaneously optimizing supply and maintenance.

Inputs to the model are limited to the types of information that should be available early in development when the maintenance concept is being formulated. The model determines the optimal Maintenance Task Distribution (MTD) and Replacement Task Distribution (RTD) for major items in an equipment. It also compares the cost of throwing away an item with the cost of repair. In making these decisions the model considers the spares, test equipment and special repairmen that will be needed to support the maintenance policy. Other costs such as transportation, cataloging and documentation are also considered.

The Selected Essential-Item Stockage Availability Method (SESAME) model is used in OSAMM to optimize supply. It should be noted, however, that the model is not designed to replace SESAME. The OSAMM should be used early in development to help establish a maintenance concept when detailed data on a new equipment is

unknown. The SESAME model should be used later in development after the maintenance concept has been determined and more detailed data is available.

The original release of the OSAMM allowed for only one repair time and one set of test equipments and special repairmen to be input for each type of repair action. The model would determine at which maintenance echelon repair should be performed given this one method of repair. The enhanced version of the model contains three run modes one of which accepts up to three different options for each repair action. The improved model is thus able to trade-off among three repair methods. This capability can be used to analyze such repair options as common, automatic, and special test equipment to determine how repair should be done as well as where it should be done. The original model remains as one of the run modes of the enhanced model, however.

A third run mode of the enhanced model examines the value of screening or "go-no/go" testing. Screening is used to verify that an item has indeed failed before it is sent back for repair or is discarded. Only one repair method is permitted when the model is run in the screening mode. In this mode, the user identifies those items which are candidates for screening. The model considers any equipment or special repairmen needed, the effectiveness, the time required, the cost of an end-to-end test program set and the supply implications to determine if screening is cost effective for each item. The decision is not made by looking at each item individually, but is made by considering the system as a whole.

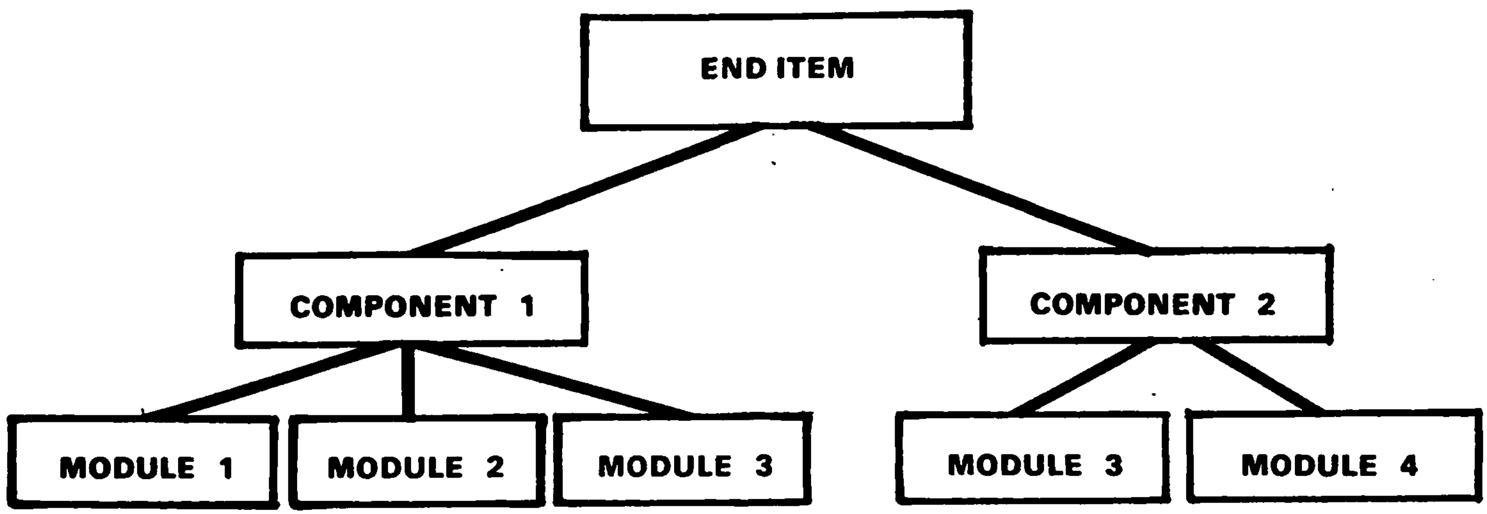
1.2 INDENTURE LEVELS

The model looks at three levels of indenture within an end item; components, modules and piece parts. The end item in figure 1 is broken down into two components. Component 1 is composed of three modules, and component 2 is composed of two modules. There is a module 3 in both component 1 and component 2. The applications listed on the bottom of the figure describe how the components and modules are assembled. Piece parts contained in the modules are not shown. Since detailed piece part data is not generally available in early development, piece parts are considered only in an aggregate manner.

Occasionally there are parts or groups of parts that do not fit exactly into the indenture level structure. These parts or groups can be designated as pseudo components or pseudo modules. One example of a pseudo component would be a component that contains no modules and has a washout rate of one. Another would be a set of wires connecting components. In general, a pseudo component is not repaired and is not removed and replaced as a unit (unless it consists of only one part). When parts that make up a pseudo component are replaced, the end item is repaired directly. Since the end item and not the component is repaired by such a maintenance action, test equipment or special repairmen required are associated with end item repair as described in paragraph 1.3b below. Repair

FIGURE 1

EQUIPMENT BREAKDOWN



APPLICATION 1: COMPONENT 1 ——— MODULE 1

APPLICATION 2: COMPONENT 1 ——— MODULE 2

APPLICATION 3: COMPONENT 1 ——— MODULE 3

APPLICATION 4: COMPONENT 2 ——— MODULE 3

APPLICATION 5: COMPONENT 2 ——— MODULE 4

times are considered in the development of the end item mean time to repair.

In order for a group of parts to be combined into a pseudo module, they must be contained in a component which is removed and replaced as a unit. Replacement of the parts will repair the component outside the end item. Test equipments or special repairmen needed are associated with the application as described in paragraph 1.3e below. Repair times are considered in the development of the mean time to repair for the component.

The difference between a pseudo component and pseudo module lies more in how repair is accomplished rather than in the actual construction. Suppose an automobile is considered as an end item. The engine would clearly be a major component. Considering the spark plugs as a pseudo module would mean that when the spark plugs fail, the engine (component) will be replaced with a new engine. The old engine will then be placed in stock after the spark plugs are changed. This is obviously not how one goes about changing the spark plugs in a car. The car (end item) is repaired directly without removing the engine. The spark plugs should therefore be considered as a pseudo component. A spark plug wrench would be listed with test equipment needed to repair the end item when the spark plug pseudo component fails.

The first step a user must take in using the OSAMM is to identify components, modules, pseudo components, and pseudo modules. A general rule for distinguishing between components and modules follows the same logic as above. If the removal and replacement of an item results in repair of the end item, that item should be considered as a component or pseudo component. If the removal and replacement of an item results in repair of another item which has been labeled a component, that item is a module or pseudo module. Once the user has classified an item as a component or module he must determine if it is a pseudo item or not. An item is considered to be a pseudo item (component or module) if it has no lower level of indenture and hence could not possibly be repaired. The lower level of indenture for a repairable component is a module, and the lower level of indenture for a repairable module is a piece part.

An example derived from electronics serves to illustrate the identification process. Suppose that the built in test (BIT) for a given electronic end item can fault isolate to the circuit card level. This means that the end item can be repaired by replacing the faulty circuit card assembly (CCA). Thus, the CCA is a component. The CCA has a lower level of indenture and can be repaired by replacing individual resistors, capacitors, integrated circuits (IC) etc. These items are called modules since their replacement results in repair of a component. Since these items cannot typically be repaired they are designated as pseudo modules. Each one of these items may be listed individually, or they may be grouped together for simplicity.

The identifications in the example above would change with a reduction in the capability of the BIT. Suppose that the BIT could

only fault isolate to the "black box" level. Then, the "black box" would be a component, and the CCA's inside the box would be modules. In this case, the modules are repairable with the lower level of indenture being the resistors, capacitors and IC's which would be called piece parts.

The model is based on applications or failure modes. This gives OSAMM greater flexibility than most models. Commonality within an end item can be considered. The same module may be contained in two different components, e.g. module 3 in Figure 1. Since failure data is input by application, the model can account for the fact that the module may have a different failure rate depending on the component in which it is installed. A significant error could occur if module 3 was treated as two different modules in each of its applications. Suppose repair of module 3 is justified if there are at least 100 failures per year. Treated individually, 50 failures in component 1 and 60 failures in component 2 would not justify repair. Module 3 would be incorrectly labeled as a throwaway. The OSAMM recognizes that the same module is in both components and considers all 110 failures in making the repair decision.

Repair level decisions made by the model are output by application. The model will describe what should be done when the end item fails due to the failure of a certain module in a certain component. As an example, suppose that the end item pictured in figure 1 has failed because module 3 has failed in component 2. The model may suggest that the end item be repaired at the organizational level, component 2 be repaired at intermediate forward and module 3 be repaired at the depot. If module 4 had caused the failure, however, the model might suggest that because module 4 requires more skill and more expensive test equipment to remove, repair of component 2 should be done at intermediate rear. The model will also determine which components and modules should be thrown away instead of repaired. This set of repair level decisions is commonly referred to as the "maintenance concept" for the equipment.

1.3 TEST EQUIPMENT AND SPECIAL REPAIRMEN

A test equipment or special repairman is peculiar at an echelon if it is not currently located at that echelon. A decision to perform a repair action requiring the use of such an equipment or repairman at that echelon would necessitate an addition to the equipment or skill level already there. New pieces of equipment would have to be purchased, or repairmen with skills not common to the echelon would have to be moved in. The model assumes that if an equipment or repairman is peculiar to an echelon it will be peculiar to all echelons below that echelon. A test equipment that is peculiar at a GSU cannot be common at a DSU, for example. On the other hand, an equipment or repairman common at a higher echelon may be peculiar at lower echelons. Common depot test equipment may be peculiar to the retail echelons.

Fractional requirements are computed for test equipments and repairmen labeled as common, but requirements for peculiar test equipments and repairmen are constrained to be integer valued. It is

necessary to compute both fractional and integer requirements for the same test equipment if it is already in use at higher echelons, e.g. depot and intermediate rear, but would be new to forward echelons. The placement of special test equipment/repairmen can be constrained allowing the user to prevent their deployment below a specified echelon.

Test equipment and special repairmen are needed for five different kinds of repair actions:

a. Repair end item whenever it fails.

The equipment or repairman is needed whenever the end item fails.

b. Repair end item when it fails due to the failure of a specific component.

Occasionally there are test equipments or repairmen that are not needed every time the end item fails but are needed when the failure is caused by a specific component. One example of this type of test equipment would be an equipment used to realign or tune the end item when a specific component such as an antenna is replaced. Another would be an equipment needed to remove and replace a specific component. Even though it is used for end item repair, requirements for this equipment are based on the number of failures of the specific component and not the total number of end item failures.

c. Repair a component whenever it fails.

The equipment or repairman is needed whenever the component fails.

d. Repair a module whenever it fails.

e. Repair a component when it fails due to the failure of a specific module.

The equipment or repairman is not normally needed to repair the component, but it is needed when a specific module fails. (See b above).

Note: An equipment or repairman can be used for more than one of the above purposes and can be used on any number of different components and modules.

1.4 A NOTE CONCERNING REPAIR LABOR

The OSAMM can account for labor costs in either of two ways. The user may define a special repairman, or he may assume that repair is performed by a common repairman. If no special repairman is assigned to a given repair action the model will use the Mean Time to Repair (MTTR) and an hourly labor rate to determine the labor cost associated with the repair action. When a special repairman is assigned, the model uses the MTTR or a time input by the user to

determine the fraction of the special repairman's time to be charged to the repair action. Total requirements for the special repairman are then computed considering all of the repair actions he must perform. If the repairman is peculiar at an echelon, these requirements are rounded to the next integer. Finally, the requirements are multiplied by an annual cost derived from the repairman's annual salary, training costs and rotation to yield the annual labor cost associated with this type of special repairman.

The user is free to select which of the methods described above are used to calculate repair labor costs. He does so by either including or not including a special repairman when describing each type of repair action. It is not necessary to use the same method for all repair actions. Some may use the simple hourly rate calculation, and others may contribute to the workload of a special repairman. Whenever repair is performed by someone specially trained for or associated with the end item, however, a special repairman should be used. Special repairmen should also be used when new skills are introduced to any repair level. Costs can be based on an hourly rate if the repairman repairs this system as well as a host of others, and if he requires no additional training outside of the basic training he would normally receive.

1.5 COST FACTORS

One time and annual recurring costs are both considered in the model. Comparisons are made using the net present value method as per DoDI 7041.3. The net present value method of comparison is based on the principle that a dollar received today is worth more than a dollar received in the future.

Time phasing of deployment is not considered by the OSAMM. Repair level decisions are based on full deployment. The model assumes that full deployment takes place in the first year. This means that cost estimates produced are not true life cycle costs, but they are useful for ranking repair level alternatives. This steady state approach was taken to simplify data requirements and processing with the expectation that it would not unduly bias the choice of one alternative over another. It does tend to exaggerate the impact of cost which will phase in over time. Note that not only do annual costs such as requisition processing build up to full deployment levels, but even "one-time" costs, such as purchase price for test equipment, are not really all incurred at one time. Test equipment, for example, need only be deployed as the weapon system is introduced over time to additional fighting units. Although some refinements to the model may ultimately be necessary, the basic premise that the choice of repair levels should be based on the full deployment will not change.

Chapter 2

INPUT

2.0 INPUT DATA FILE

Input data for the model must be stored on a file consisting of 80 column records. All records are mandatory except where noted. The input file is summarized in Figure 2. The "99" and "9999" records signal the end of various types of data. A brief description of each record or set of records is given here. Detailed definitions of the data elements can be found in Appendix A. Formats, defaults and column locations are given in Appendix B.

The input data file is read by the OSAMM preprocessor program. The preprocessor reformats user inputs and computes data required by the main program. It also performs several edit checks and produces a variety of error messages. By reviewing the preprocessor output the user can detect errors in his inputs and correct them before expending the resources to run the full model only to find that there is an error in the input data.

2.1 CONTROL PARAMETERS

The first record in the file contains information which controls the execution of the model. Among the inputs on this record are the run mode selector and the policy selector variables. The run mode selector defines the type of run that is to be made and indicates what other data will be input. For example, if the run mode selector is set for a screening run (IMODE = 1), the model will look for screening parameters. Similarly, the model will only accept more than one repair alternative for an item if the run mode selector is set for examination of multiple repair alternatives (IMODE = 2). The policy selector variables are used to limit the number of levels that are considered for certain types of repair or screening actions. The user can employ these variables to restrict the model's optimization.

2.2 END ITEM INFORMATION

The second record in the file contains information concerning the end item itself. The MTBF multiplier is used for sensitivity analysis. All MTBF's input to the model will be multiplied by this factor. The false removal rate default input on this record represents an overall average for the end item. This value will be used when a specific false removal rate is not input with an individual component or module.

2.3 TURNAROUND TIME (TAT) DEFAULTS AND END ITEM REPAIR INFORMATION

This record follows the end item information record and contains default values for turnaround times and the screening detection fraction which are used when specific data is not input with an

SUMMARY OF INPUT FILE

1. Control Parameters

2. End Item Information

3. TAT Defaults and End Item Repair Information

4. End Item Repair Alternatives (OPTIONAL) *

5. End Item Repair Equipments/Repairmen Associated With Specific Components (OPTIONAL) *
   - One record for each component and alternative to be entered

   9999

6. Deployment Information

7. Labor Rates and Transportation Information

8. Cost Parameters

9. Test Equipment Information
   - Two records per test equipment
     - Record 1 - Basic Information
     - Record 2 - Parameters by Echelon

   99

10. Repairman Information
    - Two records per test equipment
      - Record 1 - Basic Information
      - Record 2 - Parameters by Echelon

    99

11. Component Information
    - One set of records per component
      - Record 1 - Basic Information
      - Record 2 - Repair Information for First Repair Alternative *
      - Records 3,4 - Repair Information for Second and Third Repair Alternatives (OPTIONAL - can be used only if IMODE = 2) *
      - Record 5 - Screening Information (OPTIONAL - can be used only if IMODE = 1) *

    9999

12. Pseudo Component Information
    - One or two records per pseudo component
      - Record 1 - Basic Information
      - Record 2 - Screening Information (OPTIONAL - can be used only if IMODE = 1) *

    9999

Figure 2

SUMMARY OF INPUT FILE (cont.)

```
13.  Module Information
          -One set of records per module
               Record 1 - Basic Information
               Record 2 - Repair Information for First Repair
                          Alternative *
               Records 3,4 - Repair Information for Second and Third
                             Repair Alternatives (OPTIONAL - can
                             be used only if IMODE = 2) *
               Records 5 - Screening Information (OPTIONAL - can
                           be used only if IMODE = 1) *
     9999

14.  Pseudo Module Information
          -One or two records per pseudo module
               Record 1 - Basic Information
               Record 2 - Screening Information (OPTIONAL - can
                          be used only if IMODE = 1) *
     9999

15.  Application Information
          -One set of records per application
               Record 1 - Basic information
               Records 2,3,4 - Additional Information for a
                               Given Component Repair
                               Alternative (OPTIONAL - Records 3
                               and 4 can be used only if
                               IMODE = 2) *
     9999
```

* Each record marked with an asterisk contains a list of test equipments and/or repairmen. This list may be continued on an additional record if necessary.

Figure 2 (cont.)

individual component or module. These defaults along with the false removal rate default on the previous record are used to simplify input requirements. This data need not be entered again on individual component or module records unless it is different from the default values entered here.

This record also contains information concerning repair of the end item itself. Two variables, the number of end item repair alternatives and the indicator for test equipments or repairmen associated with specific components, tell the model if record types four and five will be input. If the number of repair alternatives is greater than zero, the model will look for one record type 4 for each repair alternative. If the indicator is set to one (1) type 5 records must be input.

2.4 END ITEM REPAIR ALTERNATIVES

These records define end item repair alternatives and contain lists of test equipments and/or repairmen that are required to repair the end item each time it fails as described in paragraph 1.3a. The time each test equipment or repairman is required may also be entered on this record. Each set of test equipments and/or repairmen for a given alternative is assigned a name on this record which identifies the list to the preprocessor. If more than ten (10) test equipments and repairmen are required, the list may be continued by using an equipment/repairman continuation record.

This type of record is optional and need only be included if the number of end item repair alternatives input on the previous record is greater than zero. If the number of alternatives is greater than zero, there must be one record of this type (plus continuation if necessary) for each end item repair alternative. An end item repair alternative must be defined by this type of record if test equipments or repairmen to repair the end item when specific components fail are going to be input on the following records even if no test equipments or repairmen are required for every end item failure.

2.5 END ITEM REPAIR EQUIPMENTS/REPAIRMEN ASSOCIATED WITH SPECIFIC COMPONENTS

These records contain lists of test equipments and/or repairmen that are needed to repair the end item when specific components fail as described in paragraph 1.3b. Each record of this type must have an alternative name which matches the name of an end item repair alternative defined above and the identification of the component with which the list of test equipments/repairmen is associated. Test equipments and/or repairmen listed above that are needed for every end item failure should not be repeated here.

These records are required only if the indicator on the TAT and End Item Repair Information record is equal to 1. There must be one

record (plus continuation if necessary) for each component whose failure necessitates the use of additional test equipment or repairmen under a given repair alternative. If these records are used they must be followed by a record with "9999" in the first four columns.

2.6 DEPLOYMENT INFORMATION

The next record in the file contains SESAME type data concerning the supply structure which supports the end item. The OSAMM assumes a worldwide symmetric support structure. The model divides the worldwide density by the number of each type of maintenance unit to yield the average number of end items supported by each. Thus, each unit at a given echelon is treated as if it were the same as all other units at the echelon. While this may not be exactly true, this averaging approach is sufficient when making repair level decisions.

2.7 LABOR RATES AND TRANSPORTATION INFORMATION

The record following the deployment information contains data which defines common repairmen at each maintenance level and data which is used to calculate transportation costs. The effective hourly labor rate computed from the common repairman data on this record is used by the model to account for labor costs when no special repairman is needed for a given repair action (see paragraph 1.4).

2.8 COST PARAMETERS

Other cost parameters are listed on the next record. The first ten columns of this record must be left blank. The blank field is used by the preprocessor to insure that all of the mandatory records are present in the input file. This record is required even if all of its fields are blank (using all default values).

2.9 TEST EQUIPMENT INFORMATION

Test equipment information records follow the cost parameters. The user assigns each test equipment an identification number between 1 and 30. There are two records for each test equipment. The first contains basic information, including the identification number, which is not echelon dependent. Parameters that may vary by maintenance level are listed on the second record. There is one section on this record for each maintenance echelon. If the entire section for a given echelon is left blank, the preprocessor will automatically use the values in the previous section. For example, if the parameters are the same for all echelons, the user need only enter the parameters for the organizational level. The direct support parameters will be set equal to these values since the direct support section of the record is blank. Parameters for the general support level will then be set to the direct support values which were themselves taken from the organizational section. Finally, the depot parameters are set equal to these general support values. If data is entered only in the organizational and general support

sections, values in the organizational section will be used for the organization and direct support levels, and the values in the general support section will be used for the general support and depot levels.

The two records for each test equipment must be kept together and in the proper order. Otherwise, the test equipments may be input in any order. This set of records must be followed by a record with "99" in columns 1 and 2. If there are no test equipments, a record with "99" in columns 1 and 2 must be placed after the cost parameter card.

2.10 REPAIRMAN INFORMATION

The repairmen information records follow the test equipment information. The special repairmen are also assigned identification numbers between 1 and 30. These numbers must be different than those given to the test equipments. Thus, there can be no more than a total of thirty test equipments and special repairmen. As with test equipments, two records are required for each special repairman. The first contains basic information, and the second contains parameters that may vary by echelon. The preprocessor will automatically use the values in the previous section if the entire section for a given echelon is left blank on the second record.

The two records for each special repairman must be kept together and in the proper order. This set of records must also be followed by a record with "99" in columns 1 and 2. If there are no repairmen, two cards with "99" in the first two columns must be placed after the test equipment data instead of one. There should be at least one test equipment or special repairman.

2.11 COMPONENT INFORMATION

The component information records which follow the special repairman data contain information about the individual components. The number of records for each component depends on the run mode and the number of repair alternatives. At least two records are required in all cases. The first contains basic information which describes the component. It includes a four character alphanumeric identification which identifies the component to the preprocessor. The component name which also appears on this record is only for the convenience of the user. The second record defines the first repair alternative for the component and contains the identification numbers of test equipments and/or special repairmen needed for every repair action (see 1.3c). Since each component must have at least one repair alternative regardless of the run mode, this record is required.

The number of additional records input with the component depends on the run mode. When the run mode is set to zero only the two records described above are required or permitted. If the run mode is set to examine multiple repair alternatives (IMODE = 2), one or two records defining additional repair alternatives may follow the

required records. The total number of repair alternatives to be included is entered on the first record which contains the basic component information. For screening (IMODE = 1), only one record in addition to the required records is permitted. This record contains screening information and is included if and only if the component is identified as a candidate for screening by the indicator on the first record.

The records for each particular component must be kept together and in the proper order. Otherwise, the components may be input in any order. A record with "9999" in the first four columns should follow the component records.

2.12 PSEUDO COMPONENT INFORMATION

The pseudo component information records follow the regular component records in the file. There is only one record for each pseudo component unless the model is being run in a screening mode and the pseudo component is a candidate for screening. Since pseudo components themselves are not repairable, no repair alternatives are defined. Test equipments and/or special repairmen needed for maintenance actions associated with a pseudo component are repairing the end item and therefore must be listed with test equipments and special repairmen used to repair the end item when the specific pseudo component fails (see 1.3b).

If there are two records for a pseudo component, they must be kept together and in the proper order. This set of records is followed by a record with "9999" in the first four columns. If there are no pseudo components, two records with "9999" in the first four columns must follow the regular component records. The first record signals the end of the component data, and the second signals the end of the pseudo component data.

2.13 MODULE INFORMATION

The module information records which follow the pseudo component information records are arranged in exactly the same manner as the component information records. Module data is also followed by a record with "9999" in the first four columns.

2.14 PSEUDO MODULE INFORMATION

The pseudo module information records which follow are arranged in the same manner as the pseudo component information records. Unlike pseudo components, however, no failure rate information is input on these records. As with repairable modules, failure information is entered on the application records. Test equipment and special repairmen needed for maintenance actions associated with a pseudo module are repairing the component and therefore must be listed with the appropriate applications (see 1.3e).

If there are two records for a pseudo module (screening mode), they must be kept together and in the proper order. The pseudo module records are followed by a record with "9999" in the first four

columns. If there are no pseudo modules, two records with "9999" in the first four columns must follow the regular module records. The first record signals the end of the module data, and the second signals the end of the pseudo module data.

2.15 APPLICATION INFORMATION

The final set of records in the file describes the applications. There is one required record that defines each application. It lists a module, the component to which it belongs, and the mean time between failure (MTBF) of the module in this application. Since a given module may be part of different components, it may appear in several applications. Thus, the failure rate depends not only on the module itself, but also on where it is installed. Multiple occurrences of a module in the same component should be entered as one application, however. The MTBF for this application should represent the combined MTBF of all occurrences of the module in the one component. Since each repairable component must contain at least one module, it must be listed with at least one application. Similarly, since each module (repairable or not) must be part of a component, each module must be listed with at least one application.

All data concerning repair of components is normally entered with the component information. In some cases, this data may change when the component failure is due to a specific module. The most common example of this type of data is test equipment and/or special repairmen in addition to those already listed with component repair information that are needed to repair the component when the specific module has failed (see 1.3e). The component mean time to repair (MTTR) may also change for a given application. Additional or changed repair information of this type is input on the optional application records described below.

There is one additional repair information record for each component repair alternative to be modified. Thus, there can be more than one additional record only if the run mode is set to examine multiple repair alternatives (IMODE = 2). The data on an additional repair information record pertains to repair of the component when the specific module fails for the component and module listed on the basic application record. The component repair alternative that is being modified is identified on the additional record. This identification must match the identification of a repair alternative that was defined when the component data was input. If there is more than one record for an application, they must be kept together and in the proper order. Otherwise, the applications may be input in any order. An ending record with "9999" in the first four columns must be placed at the end of the application records.

Chapter 3

PREPROCESSOR OUTPUT

3.1 INTRODUCTION

The preprocessor generates an output which should be used to check the input data for errors before running the entire model. Several error messages, which are discussed in Appendix D, point to specific errors in the input data. All user inputs are listed on the preprocessor output. Some computations done by the preprocessor are also reflected in the output. Sample input files and the resulting output files are given in Appendices E, F and G.

3.2 NORMAL OUTPUT

Preprocessor output is divided into several sections. The first contains control, end item, deployment and general cost data. The next section has test equipment and special repairman data. The final sections list data associated with specific components, modules, and applications.

The control parameters describe the maintenance policies the model will consider. They give the lowest echelon where the end item, components, and modules can be repaired. The model will not consider any policy which has repair below these levels. In a screening run the lowest echelons to screen components and modules are also listed. End item information is output as it was input. The false removal rate default is applied to each component and module if a false removal rate is not entered with the specific module or component. Similarly, turnaround times listed with the end item information are used when turnaround times are not entered with individual components and modules. In a screening run, turnaround time defaults and a detection fraction default, which are also used when data is not entered with individual components and modules, are listed. Test equipments and special repairmen needed to repair the end item every time it fails and those needed only when specific components fail follow this information.

Deployment information and cost parameters as they were input by the user are output after end item information. The results of several calculations done by the preprocessor are also shown. The average Operational Units of Program (OUPS) is computed from the claimants and the deployment density. The effective labor rate is the hourly salary of a common repairman loaded with the cost of benefits and adjusted for productivity. The transportation cost per pound is computed from the cost per pound per mile and the distance between echelons. All other input cost parameters are also listed. Cost parameters in terms of present value that are actually used by the model are given at the end of the cost parameter output.

The next section of the preprocessor output contains test equipment and special repairman data. The maintenance level listed under "common above" gives the highest echelon at which a test equipment or special repairman is peculiar. It will be considered as common for all echelons above that echelon. Test equipments and special repairmen which have nothing under "common above" are considered as common everywhere. Those which are common above the depot are peculiar everywhere. If a test equipment or repairman is designated as "For Repair Only" it is not used for diagnostics and consequently is not required for false removals. Echelon data is listed only for those maintenance echelons where the test equipment or repairman can be placed. The preprocessor automatically fills in data for echelons where no data has been input by the user. The output reflects this process and lists the data that will be used by the model. The only data in this section that was not input by the user is the present value. Details of the present value calculations can be found in Appendix C.

The final sections of preprocessor output contain all of the data associated with the individual components, modules, and applications. Component and module names are only for the convenience of the user. The component and module ID's, however, are used by the preprocessor for identification. Therefore, each component and module must have a unique ID. Each component, module and application is given a reference number by the preprocessor to aid in debugging. These numbers are cumulative except for a jump of 1 between pseudo modules and applications. The extra reference number is reserved for internal purposes, Components, modules and applications are also assigned separate numbers which are not cumulative.

Preprocessor output for components is structured in the same manner as is the input. There is basic component data, data which describes repair alternatives, and screening data (IMODE = 1). Most data appears exactly as it was input by the user. If the user has left any data fields blank, the defaults used by the model will be listed. Pseudo component output is also a listing of the inputs. No repair alternatives are given since pseudo components are not repairable, but there will be screening information if the pseudo component is a candidate for screening (IMODE = 1). The failures per year, which are computed from the mean time between failure (MTBF) and the annual operating hours, are the expected number of failures of the pseudo component in one end item per year. This value is given in exponential or "E" format. In "E" format the value .1E+01 means 1.0, and the value .1E-01 means 0.01.

Module and pseudo module outputs are essentially the same as component and pseudo component outputs. The additional information output with modules describes the parts that are necessary to perform module repair. The "new parts" entry gives the number of piece parts in the module which will require a new NSN if the module is to be repaired, and the "parts cost per repair" is the average price of piece parts required for each repair action. There is no failure data for pseudo modules since failure information for pseudo modules appears with the applications.

Each application is identified by the component and module name, number, and ID. The ID's are input by the user on the application data record. The preprocessor supplies the names and numbers from the component and module information. The MTBF and the number of failures per end item per year of the module in the component are also printed. If any component repair information is modified for a particular application the new information is also listed. The "pages saved" represents the number of pages of technical documentation concerning repair of the component that would be saved if the entire component were thrown away when the module failed.

The preprocessor output concludes with a summary of the failure data that has been input. The number of failures per end item per year is the sum of the pseudo component and application failures. This number is used along with the annual operating hours to derive an MTBF for the end item. The end item MTBF input by the user is also repeated here. If the derived MTBF is substantially greater than the input MTBF, then either individual MTBF's are too high, or some items and their failures have been omitted. If, on the other hand, the derived MTBF is much lower than the input MTBF, then there are more end item failures than expected, and the input MTBF may have to be changed. In either case the discrepancies should be reconciled.

Chapter 4

FINAL OUTPUT

4.1 INTRODUCTION

The OSAMM can be run in either an optimization mode or an evaluation mode. In the full optimization mode a maintenance concept which minimizes cost is chosen by the model and evaluated. In the evaluation only mode the costs associated with a maintenance concept chosen by the user are computed. The evaluation mode is useful for performing sensitivity analysis and answering "what if" type questions. Except for a message which describes the performance of the optimization, the model's output is the same in either case.

The OSAMM actually creates several files which present the model's results in various formats and levels of detail. Samples are presented in appendices E, F, and G. The main output file describes the maintenance concept either chosen by the model (optimization run) or input by the user (evaluation run) and contains test equipment and special repairman requirements as well as summaries of costs associated with individual components and modules. The main output file also lists the initial spares requirements and the SESAME type parameters such as MTD and RTD that were used to compute them. A second output file breaks out costs summarized on the main output. The third output file contains stockage lists and costs for organizational and direct support units.

4.2 MAIN OUTPUT FILE

The main output file begins with the output from the preprocessor. In an optimization run this is followed by a message which describes the performance of the optimization. The message either states that an optimum solution was found or that the solution found is within a given percentage of the optimum. The optimization algorithm is set to stop if a solution is within one half of one percent of a bound on the best solution. Since the bound may or may not be achievable, the solution found may indeed be optimal even though the message states that it is only within a percentage of optimum.

4.2.1 Maintenance Concept

The remainder of the output file contains the results of the run. It begins with a listing of the maintenance policies suggested by the model (optimization run) or input by the user (evaluation run). The level at which end item, component, and module repair should be performed is given for each application. Suppose application 1 consisted of MODULE 1 and COMPONENT 1, and the repair levels for end item, component, and module were ORG, DSU, and DEP

respectively. This would mean that when the end item failed because MODULE 1 failed in COMPONENT 1, the end item should be repaired at the organizational level, COMPONENT 1 should be repaired at the DSU, and MODULE 1 should be repaired at the depot. If the component should be thrown away instead of repaired, no repair level will be listed for the module.

To avoid the deployment of an extra test equipment or special repairman which would be idle for most of the time, it may sometimes be advantageous to have two different maintenance policies for the same application. As an example, suppose that one special test equipment can handle almost all repair of a module at a DSU. Instead of buying a second piece of test equipment to handle all repair of the module, it may be better to ship a few modules to the GSU when the test equipment is unavailable at the DSU. It may even be better to throw away a few modules rather than buy an extra piece of test equipment that is hardly ever needed. When the model suggests such a split maintenance policy, a sensitivity flag will be printed. The number in the fraction of time column will be the fraction of repairs performed according to the maintenance policy listed.

Certain approximations are made by the model when considering split maintenance policies. The approximations are not made in evaluating the costs for these policies, however. Although the approximations do not introduce a significant error, split maintenance policies suggested by the model are flagged with an asterisk in the sensitivity column and should be examined by the user in his sensitivity analysis as described in Chapter 5. A more detailed discussion of the approximations can be found in the theoretical documentation to the model.

The column headed, "MODULE PROMOTED," will generally be blank. An asterisk in this column indicates that the module is considered as a line replaceable unit (LRU) for this application and is included in the availability computation. A module is promoted if it is removed from a component at the same level as the end item is repaired and if the component has a washout rate of zero. If the promoted module is the only module in the component, the MTD and RTD for the component will be zero. The component will not be stocked since it never washes out and the end item is repaired by replacing the module. There is no need to stock the component if the module is stocked and considered in the availability computation.

The maintenance policies are followed by a listing of screening policies if IMODE = 1 or by a description of repair alternatives selected if IMODE = 2. No such output is given or required if IMODE = 0.

Screening policies are listed by component and module. Items should be screened at the echelon listed before they are sent back for repair at the designated maintenance level. As with maintenance policies, the fraction of time a particular screening policy is to be followed is given for each item. This fraction may be less than one either because there is a true split policy or because the fraction is equal to a theoretical bound. A true split policy, marked by an

asterisk in the sensitivity column, is one that is followed for a fraction of time which is less then the theoretical bound. One example would be an item which is screened at different levels but is always repaired at the same level. This is done to reduce the number of test equipments and special repairman required. The theoretical bound arises because the fraction of items screened at an echelon cannot be greater than the fraction of the items which are returned to that echelon but are not repaired there. Suppose, for example, that a module, which is always repaired at the depot, is part of two different components. If one component is repaired at the DSU and the other at the depot, only those modules that are part of the first component can be screened at the GSU. In this case, the bound will be less than one. If the fraction of time a particular policy can be followed is equal to its bound a "B" will be printed in the sensitivity column. Sensitivity analysis is not normally required since any item reaching the level and not repaired there is screened. There is no split in the policy.

When there are multiple repair alternatives (IMODE = 2), the maintenance policies are followed by a listing of the alternative selected for each repair action. Each repair action is assigned a reference number which is used when performing sensitivity analysis. The repair action is then described by identifying the item being repaired (end item, component or module), the maintenance level at which the repair takes place, and the item that is being removed and replaced to effect repair. Finally, the repair alternative suggested by the model and the fraction of the time this alternative should be used are listed. As with screening policies, these fractions may be less than one or sum to a number less than one for several reasons. There may be true split repair alternative decisions which are generated to reduce the number of test equipments and special repairmen that are required. In this case, which is marked by an asterisk in the sensitivity column, two different repair alternatives are used for the same item at the same level. A second reason for the total of the fractions associated with a particular reference number being less than one is that an item or its higher assembly may sometimes be thrown away. These cases are marked by a "T" in the sensitivity column. As an example, suppose a module is part of two different components one of which is discarded at failure. The fraction of time a repair alternative may be followed is limited by the fraction of modules that are part of the component which is repaired. The third reason for fractions which total less then one is that the basic maintenance policies for an item or its higher assembly may be split. This can also occur if a module is part of two different components. The model may suggest that when the module fails in the first component it should be repaired at the GSU, but when it fails in the second it should be repaired at the depot. Even though the fractions associated with the basic maintenance decisions are all 1.0000, this is a split because the module is repaired at different levels. The letter "Q" is printed in the sensitivity column when the fractions are less than one because of a split maintenance policy.

A sample of this section of the output is given in Figure 3. The complete output for the run can be found in Appendix G. Several examples will illustrate how to interpret this data. For reference number 1 the output should be read as follows: "When the end item is repaired at echelon 1, organization, by removing and replacing component 1, the RT, repair alternative 1 which has no name (ØNAM) should be used." Similarly, for reference number 9 the output is read as "When module 1, the CHASIS, is repaired at echelon 3, GSU, by removing and replacing PARTS repair alternative 1 called ALT 1 should be used." Finally, for reference number 51 the output means: "When component 2, the Power AMP, is repaired at echelon 3, GSU, by removing and replacing module 15, the CHAS FILT, repair alternative 1 called ATE should be used."

4.2.2 Test Equipment and Special Repairman Requirements

Test equipment and special repairman requirements are divided into two categories. The first consists of the requirements for test equipments and repairmen where they are peculiar. These requirements are given as both fractional and whole numbers. The fractional numbers indicate the extent to which the test equipment or repairman is actually utilized. Since a fraction of a peculiar test equipment or repairman cannot be deployed, however, the integer quantities are used for all calculations.

Requirements for test equipments and special repairmen where they are common, given next, can be fractional. These test equipments and special repairmen' may have to be deployed, but the quantity depends on what is currently available at the echelon. As an example, suppose a piece of test equipment at DSU is only used to fifty percent of its capacity. If the requirement for this equipment to support the new end item were 2.4, only two more need be deployed. Three more would have to be deployed if the requirement were 2.9.

The remainder of the output in both the peculiar and common categories summarizes costs and quantities for each test equipment and special repairman. The value in the column headed "Total Qty at Echelon" is computed as the quantity per shop times the number of shops at that echelon. The hardware cost listed is the present value of the costs associated with the total quantity of the test equipment or special repairman. This includes annual maintenance for test equipments and training for special repairmen. The final column of test equipment and special repairman output adds quantities across echelons from organization to depot. Suppose, for example, that the total requirements for a test equipment at DSU, GSU, and depot were Ø.2, Ø.3, and Ø.4 respectively. Then, the entry in the column for the DSU would be Ø.2. The entry for GSU would be Ø.5 (Ø.2 + Ø.3). The entry for the depot would be Ø.9 (Ø.5 + Ø.4). Thus, the entry in this column associated with the last appearance of the test equipment in the table represents the total quantity of the test equipment that will be required worldwide.

REF NO	WHEN (X)	NAME	REPAIRED AT	BY REMOVE AND REPLACE OF	USE REPAIR ALTERNATIVE	THIS FRAC OF THE TIME	SENSITIVITY FLAG
1	X= EI		1 ORG	COMP 1 RT	1 ONAM	1.0000	
2	X= EI		1 ORG	COMP 2 PWER AMP	1 ONAM	1.0000	
3	X= EI		1 ORG	COMP 3 ECCM	1 ONAM	1.0000	
4	X= EI		1 ORG	COMP 4 VEH MOUNT	1 ONAM	1.0000	
5	X= EI		1 ORG	COMP 5 IVRCU	1 ONAM	1.0000	
6	X= EI		1 ORG	COMP 6 MAN ANT	1 ONAM	1.0000	
7	X= EI		1 ORG	COMP 7 VEH ANT	1 ONAM	1.0000	
8	X= EI		1 ORG	COMP 8 BAT CASE	1 ONAM	1.0000	
9	X= MOD	1 CHASIS	3 GSU	PARTS	1 ALT1	1.0000	
12	X= MOD	4 TUNER/MIX	4 DEP	PARTS	1 ATE	1.0000	
13	X= MOD	5 IF DEMOD	4 DEP	PARTS	1 ATE	1.0000	
14	X= MOD	6 EXCITER	4 DEP	PARTS	1 ATE	1.0000	
15	X= MOD	7 SYNTHESIS	4 DEP	PARTS	1 ATE	1.0000	
17	X= MOD	9 SW ASSY	4 DEP	PARTS	2 STE	1.0000	
21	X= MOD	13 AUD I/O	4 DEP	PARTS	1 ATE	1.0000	
23	X= MOD	15 CHAS FILT	4 DEP	PARTS	1 ATE	1.0000	
26	X= MOD	18 ONE-WATT	4 DEP	PARTS	1 ATE	1.0000	
27	X= MOD	19 PWR SUPP	4 DEP	PARTS	1 ATE	1.0000	
37	X= COMP	1 RT	2 DSU	MOD 1 CHASIS	1 ALT1	1.0000	
38	X= COMP	1 RT	2 DSU	MOD 2 CONTROL	1 ALT1	1.0000	
39	X= COMP	1 RT	2 DSU	MOD 3 PWR ASSY	1 ALT1	1.0000	
40	X= COMP	1 RT	2 DSU	MOD 4 TUNER/MIX	1 ALT1	1.0000	
41	X= COMP	1 RT	2 DSU	MOD 5 IF DEMOD	1 ALT1	1.0000	
42	X= COMP	1 RT	2 DSU	MOD 6 EXCITER	1 ALT1	1.0000	
43	X= COMP	1 RT	2 DSU	MOD 7 SYNTHESIS	1 ALT1	1.0000	
44	X= COMP	1 RT	2 DSU	MOD 8 TWO-WIRE	1 ALT1	1.0000	
45	X= COMP	1 RT	2 DSU	MOD 9 SW ASSY	1 ALT1	1.0000	
46	X= COMP	1 RT	2 DSU	MOD 10 REMOTE I/O	1 ALT1	1.0000	
47	X= COMP	1 RT	2 DSU	MOD 11 CON MATCH	1 ALT1	1.0000	
48	X= COMP	1 RT	2 DSU	MOD 12 AUD PS	1 ALT1	1.0000	
49	X= COMP	1 RT	2 DSU	MOD 13 AUD I/O	1 ALT1	1.0000	
50	X= COMP	1 RT	2 DSU	MOD 14 AUD CON	1 ALT1	1.0000	
51	X= COMP	2 PWER AMP	3 GSU	MOD 15 CHAS FILT	1 ATE	1.0000	
52	X= COMP	2 PWER AMP	3 GSU	MOD 16 AMP BD	1 ATE	1.0000	
53	X= COMP	2 PWER AMP	3 GSU	MOD 17 DECODER	1 ATE	1.0000	
54	X= COMP	3 ECCM	3 GSU	MOD 27 ECCM PTS	1 ATE	1.0000	
55	X= COMP	4 VEH MOUNT	2 DSU	MOD 18 ONE-WATT	1 ALT1	1.0000	
56	X= COMP	4 VEH MOUNT	2 DSU	MOD 19 PWR SUPP	1 ALT1	1.0000	
57	X= COMP	4 VEH MOUNT	2 DSU	MOD 20 PA CHASIS	1 ALT1	1.0000	
58	X= COMP	5 IVRCU	2 DSU	MOD 21 ANALOG	1 ALT1	1.0000	
59	X= COMP	5 IVRCU	2 DSU	MOD 22 IVRCU PS	1 ALT1	1.0000	
60	X= COMP	5 IVRCU	2 DSU	MOD 23 DECOD/TIM	1 ALT1	1.0000	
61	X= COMP	5 IVRCU	2 DSU	MOD 24 MICRO	1 ALT1	1.0000	
62	X= COMP	5 IVRCU	2 DSU	MOD 25 IVRCU CHAS	1 ALT1	1.0000	
63	X= COMP	4 VEH MOUNT	2 DSU	MOD 26 MTG TRAT	1 ALT1	1.0000	

FIGURE 3 - SAMPLE MULTIPLE REPAIR OUTPUT

4.2.3 Logistics Costs

Logistics costs for components and modules are listed after test equipment and special repairman requirements. Initial spares, consumption spares, common labor and TPS development costs are presented on the main output file. Other costs associated with components, modules, and module repair parts are only summarized here. Costs presented are not true "life cycle costs" as noted in paragraph 1.5. All costs, except for initial spares, are given in terms of net present value. Initial spares costs are incurred "up front" and need not be discounted. Consumption spares costs are the present value of the replenishment spares that will be purchased over the operating life of the end item. Similarly, labor costs represent the present value of common repairmen used to fix individual items. If a special repairman is used to repair an item the common labor cost will be zero.

In a screening run (IMODE = 1), the logistics costs are followed by a description of some of the costs and savings associated with screening each component and module. These costs do not reflect all of the savings resulting from screening since they do not include any reduction in test equipment or special repairmen which cannot typically be identified with a single component or module. The screening cost shown is the cost of common labor needed to screen each item. As with repair labor, this value will be zero if a special repairman is used. The repair labor saved represents the cost of the labor that would have been expended to perform diagnostics on false removals that were detected by screening. The difference between other logistics costs with screening and what they would have been without screening is also listed.

4.2.4 SESAME Type Inputs and Outputs

The maintenance concept for each component and module is restated in terms of a washout rate, maintenance task distribution (MTD), and replacement task distribution (RTD) at the beginning of this section of output. The parameters listed here are those that were used by the SESAME algorithms within the model to compute initial provisioning requirements. Component turnaround times shown are adjusted to include time waiting for modules needed for repair, and module turnaround times are similarly adjusted to reflect time waiting for repair parts.

Two sets of SESAME input parameters are listed in a screening run. The first considers the effect of screening, and the second shows the parameters as they would be without screening. In the first set, which is used for provisioning calculations, the detection of false removals at a given level appears in the MTD as repair at that level. As an example, suppose an item to be screened at GSU and repaired at the depot has a washout rate of 0.05, a false removal rate of 0.10, and a detection fraction of 0.80. If there are 100 actual failures there will be 110 total removals. Since it is assumed that 5% of the 10 false removals will washout, 7.6 (.95 x 10 x .8) of the 10 false removals will be detected at the GSU. This represents 6.9% of the total removals. Thus, the MTD at the GSU is equal to 0.069 (7.6/110).

SESAME type output follows the inputs described above. The suggested number of initial spares at each level and the associated total cost are given. The effective failure rate in terms of failures per end item per year that was used to compute the stockage is also printed here.

The main output file concludes with a summary of all costs computed by the model and the operational availability achieved given the suggested maintenance policies and stockage. In some cases the operational availability achieved will be higher than the target input by the user. This can occur for either of two reasons. If the curve parameter used is zero, then the operational availability was achieved by standard initial provisioning (SIP) calculations. Stockage below SIP quantities is normally not considered. If, on the other hand, the curve parameter is greater than zero and the operational availability is above the target, the operational availability follows what is termed a "step function." This means that stocking one less of an item will cause the operational availability to drop below the target. Thus, the target cannot be met exactly. The situation usually occurs when there are only a few components in the end item. To achieve a lower operational availability in this case the target must be reduced.

4.3 OTHER COST BREAKOUT

The second OSAMM output file reports other costs such as inventory holding and cataloging which are summarized on the main output file. All costs shown are given in terms of net present value over the life of the end item. In addition to costs associated with individual components and modules, logistics costs for module repair parts are listed on this file. These costs are only estimates computed from the limited part input data. They are included as a means of considering repair parts when making repair level decisions for modules. No parts costs will be shown for modules that are to be discarded at failure.

The last page of this file contains additional information for the more advanced user. It begins with a summary of the availability search performed by the evaluator. The curve parameters tried and the resulting operational availabilities are listed. The average waiting times for SRU's which follow are the average of the waiting times that have been added to individual turnaround times at each level. The average amount of down time resulting from the use of a contact team or the end item being evacuated to the DSU for repair is then listed as down time due to CTDEL. (This delay time would be added to the end item MTTR when running the SESAME model.) If all end item repair is done at the organizational level, this time will be zero. The average annual cost of common labor at each maintenance location concludes this output. The values given here do not include present value. The annual number of maintenance man-hours at each level can be derived from these numbers by dividing them by the effective labor rates listed on the preprocessor output.

4.4 STOCKAGE LISTS

The third OSAMM output file contains stockage lists for organizational and direct support units. The quantity of each component and module to be stocked is given along with its dollar value. A one letter code identifies each item as a component (C) or module (M). Unless a module has been promoted, operational availability is driven primarily by component stockage.

Chapter 5

SENSITIVITY ANALYSIS

5.1 INTRODUCTION

Several types of sensitivity analysis can be performed using the OSAMM. They range in complexity from a change to a single input parameter to the evaluation of a completely different maintenance concept. Only a few types of sensitivity analysis will be discussed here. The analysis that should be performed depends on the system being studied, the quality of the input data, and the results of the optimization. Very often one sensitivity run will suggest several others. Before discussing any type of sensitivity in detail, however, another output file and its use must be described.

5.2 POLICY FILE

In addition to the output files described in Chapter 4, an optimization run will produce a file which contains, in abbreviated form, the maintenance policies chosen by the model. Sample policy files for each run mode are included in appendices E, F and G. In all three cases, the data on the policy file is equivalent to the data reported on the main output file in the maintenance concept section.

Each policy file begins with a listing of the maintenance policies by application. There are three entries on each line in this portion of the file. The middle entry identifies the application by number. The first entry consists of three digits that specify the maintenance levels at which the end item, component and module should be repaired. For this listing and in subsequent listings on the file, 1 = ORG, 2 = DSU, 3 = GSU, 4 = DEP and 5 = TOSS (throwaway). The final entry on the line is the fraction of the time the policy specified by the first entry should be followed for that particular application. If this fraction is less than one (1.0000) there will be multiple lines for the same application. The sum of the fractions for each application should equal one. If IMODE = 0, there is no other data on the policy file.

In a screening run (IMODE = 1) the basic maintenance data is followed on the policy file by a description of the screening decisions made by the model. These entries are labeled "CRV" and correspond to the "SCREENING POLICIES BY ITEM" on the main output file. The screening results are given as a sequence of digits which are followed by the letter "S". The first one, two, or three digits are the reference number of the component or module being screened. The same reference number is listed on the main output file. The last two digits in the series are the maintenance level at which the item should be screened and the level at which it is repaired. The fraction of the time this screening policy should be followed is also listed for each item.

In a multiple repair alternative run (IMODE = 2) the basic maintenance data on the policy file is followed by the repair alternative selected for each maintenance action. Each line in this portion of the file begins with "WVA". The series of digits which describes the alternative begins with the reference number which is the same as the reference number on the main output file. The last two digits give the maintenance level at which repair is to be performed and the number of the repair alternative that should be used. As with the other types of policy files, each line concludes with a number which represents the fraction of the time that particular policy should be followed.

5.3 EVALUATION OF USER DEFINED MAINTENANCE POLICIES

Several types of sensitivity analysis can be performed by running the OSAMM in an evaluation only mode. In this mode the policy file described above is an input to the model. The evaluator computes costs associated with the policies listed in that file. The policy file used can be the result of a full optimization run, or it can be generated by the user. Suppose, for example, that the user wished to evaluate the cost of the optimum policy if the unit prices of some components and modules are changed. Once the unit prices on the basic data file are modified, the new data can be evaluated using the policy file created by the optimization run. If, on the other hand, the user wished to keep the basic data intact but wanted to see the effect of changing the optimum policy, the policy file can be edited, and the evaluator run using the new policy file.

Since a policy file must follow a specific format, user generated files are typically modified versions of files created by an optimization run. A text editor can be used to change the digits which describe the maintenance policy, screening policy or repair alternative chosen. Changes to the basic maintenance policy are relatively simple. The user need only change the digit representing a repair level or the fraction of time a particular policy is followed on the first part of the policy file. Care must be taken to insure that the fractions assigned to the same application always sum to 1.0000. A line in the first part of the file can be deleted only if there are multiple lines for the same application and the fractions on the remaining line or lines are adjusted so that the total is 1.0000. Similarly, a line may be added to this part of the file if a split policy is being generated.

When IMODE = 0 the maintenance policies by application are the only entries on the policy file. If IMODE = 1 or IMODE = 2 the CRV or WVA entries are related to the repair level entries. Since these relationships are somewhat complex, the evaluator will automatically adjust this data if the maintenance policies for some applications are modified as described above. The user should not modify the CRV or WVA entries when changing basic maintenance policies. In a screening run, the screening level will remain the same. In a run

which considers multiple repair alternatives, the same repair alternative as originally selected will be assumed. If an item is changed from throwaway to repairable, the first repair alternative will be used. All fractions associated with the CRV or WVA entries will be automatically adjusted as appropriate. The evaluator will also create a new policy file containing the revised CRV or WVA information. This policy file may be used in subsequent sensitivity analysis.

The user may modify CRV entries to consolidate split screening decisions or to add or delete screening at a level. To consolidate a split screening decision the line or lines which describe the screening to be eliminated should be deleted from the file. The fraction on the one remaining line should then be set to 1.0000. If there is a bound on this fraction which is less than 1.0000 the evaluator will automatically reset the fraction equal to the bound. If screening is to be added at a given level a line or lines must be added to the file. Each line must follow the format of the other CRV entries and have a reference number equal to the reference number assigned to the item by the preprocessor. There is one line for each level at which the item is repaired as long as the repair level is above the desired screening level. The fraction of time the policy is to be followed should be set to 1.0000 on each line. The evaluator will automatically reset these fractions to their upper bounds. Finally, screening of an item may be eliminated simply by deleting any lines in the CRV section of the policy file which refers to that item.

The user may consolidate a split repair alternative decision or change a repair alternative decision by modifying the WVA entries on the policy file. To change the repair alternative for an item the user need only change the digit which specifies the repair alternative on the line or lines in the WVA section of the policy file which correspond to repair of that item. The lines which must be changed can be identified by matching the reference number on the policy file with the reference number on the main output file. There will be no WVA entries for items that are to be discarded at failure. If the user changes the item to repairable the first repair alternative will be used, and the appropriate WVA entries will appear on the new policy file. The new file can then be used to select a different repair alternative. If the user wants to consolidate split policies where repair of the same item is performed using two different repair alternatives at the same level, he can delete the line representing the unwanted alternative and increase the fraction associated with the desired alternative to 1.0000. Once again, the evaluator will make any adjustments necessary to the fraction of time a policy is followed. It should be noted here that if the repair level decision for an item is split (indicated by a "T" or a "Q" on the output) the maintenance policies by application given at the beginning of the policy file can also be changed.

5.4 INPUT PARAMETER CHANGE

The simplest type of sensitivity that can be performed using the OSAMM involves changing one or more of the basic input parameters.

This should be done if the user is unsure of his inputs. After changing the data on the input file, the optimization can be rerun. If the maintenance concept does not change then the user can feel confident in the final maintenance decisions regardless of the value of the particular input parameter. If on the other hand, the maintenance policies change, additional analysis is recommended. The data in the new input file should be evaluated using the maintenance policy file created by the original optimization (See 5.3). The results of this analysis when compared with the cost of the optimum policy for the new data help quantify the risk if the maintenance concept chosen by the original optimization is adopted and the new input data is correct. Similarly, the new maintenance policy file can be evaluated using the original input data file to assess the risk associated with adopting the new maintenance concept.

5.5 RELIABILITY CHANGES

Reliability data is often suspect and therefore is a candidate for sensitivity analysis. The OSAMM has an input variable which can be used to make universal changes to all input MTBF values. The MTBF multiplier on the end item information record automatically adjusts each input MTBF. The user can edit the input file and change the multiplier to modify all MTBF's without manually changing each one. The optimization can then be rerun, and the same type of analysis as described above for a single input parameter change can be performed.

A few cautions concerning the use of the MTBF multiplier must be noted here. First, the multiplier effects all MTBF's in the same proportion. A value of 0.5 will cut all MTBF's in half. If some MTBF's are increasing while others are decreasing, the multiplier cannot be used, and the individual MTBF's must be changed on the input file.

The user is also cautioned against overusing the MTBF multiplier. There is sometimes a tendency to rerun the optimization with each of several MTBF multipliers. This consumes large amounts of computer resources and is often not necessary. If the maintenance policies do not change when MTBF's are cut in half or doubled, they will not change when the MTBF's are multiplied by 0.75 and 1.5. It is generally more efficient to examine the effects of drastic changes in reliability before considering 5% or 10% variations.

5.6 SPLIT MAINTENANCE POLICIES

Sensitivity analysis of true split maintenance policies is always recommended. When the model suggests that a repair action should sometimes be performed at one maintenance level and sometimes at another the evaluator should be run with a policy file that assumes all repair at one level or the other. The policy file is created by editing the original policy file, eliminating multiple lines for the repair action in question, and changing the fraction on the one remaining line to 1.0000 as described in paragraph 5.3. This procedure should also be followed for a split screening policy or for a split decision on the repair alternative selected if an asterisk is printed in the sensitivity column.

This type of sensitivity analysis can be used to pinpoint the requirement that caused the policy to be split. Very often a test equipment or special repairman is being used to its capacity. Rather than add an extra test equipment or repairman the model will shift a fraction of the repair to another level. The splitting of the maintenance policy, although possibly impractical, usually results in lower total costs. By performing the sensitivity analysis the user can determine what it costs to be "practical".

Since some approximations that are made for the optimization are not made for final evaluation, the "pure" policy may occasionally be slightly less expensive than the split policy. In this case the difference in total cost should not be significant. If the split policy is more economical, however, the difference in total cost may be considerable. Details of the approximations can be found in the theoretical documentation to the model [1].

Chapter 6

ADVANCED TOPICS

6.1 INTRODUCTION

The information presented in this chapter is intended for the more advanced OSAMM user. Section 6.2 contains several techniques that can be used to model some unusual situations. Section 6.3 is designed primarily for the user who is interested in the inner workings of the model. Whereas the average user may occasionally employ some of the special techniques, he typically need not concern himself with the details of how the model functions.

6.2 SPECIAL MODELING TECHNIQUES

The OSAMM, like any other computer model, does not fit every situation exactly. Special techniques have been developed to adapt the inputs so that some of these circumstances can be modeled. Several of these are described below. It is expected that as individual users gain experience with the model they will develop other innovative modeling approaches.

6.2.1 An Example of Components Inside a Component

The following example is presented to illustrate how an item which may not appear to be a component can be considered as a component for modeling purposes. Suppose an electronic box contains ten (10) circuit card assemblies (CCA's) which are numbered 1 through 10. If one of the first six fails the entire box must be replaced and sent back for repair. If one of the last four fails, however, the CCA can be removed and replaced directly. According to the definitions of components and modules in section 1.2 the box and the last four CCA's should be considered as components. The first six CCA's should be modules. This is exactly how the problem is modeled. The component representing the electronic box is entered with its unit price equal to the price of the entire box including all ten CCA's. There are six applications for the component corresponding to the six CCA's which are modules. The last four CCA's are entered as components with their repair parts considered as pseudo modules. Since the model computes the failure rate for a component from the applications, the box will be sent for repair only when one of the first six CCA's fails. Stockage for the box will also be based on only those failures. The last four CCA's will be treated as components and considered separately in the availability calculation.

6.2.2 Promoted Modules

As noted earlier, if a component and the end item are repaired at the same level, and the washout rate of the component is zero, modules in the component will be promoted and considered in the availability calculation. The user can utilize this feature to have

the model help select which items should be line replaceable units (LRU's). Since the model will compute replenishment spares for a component based on a minimum washout rate of Ø.ØØ1% even if the input washout rate is zero, the user can input a zero washout rate and allow the model to promote modules as appropriate without totally sacrificing the replenishment calculation. In addition, there will always be at least one of each component stocked at the depot. The only exception to the baseline replenishment calculation for a component occurs if all of its modules are promoted. In this case, the component is eliminated from the replenishment and cataloging cost calculations. Repair labor and test equipment costs are considered, however.

It may be an informative exercise to set the washout rate of some components to zero for a sensitivity run even if their inherent washout rates are greater than Ø.ØØ1%. If any modules are promoted as a result they can be recoded as components in the original input file, and the end item MTR and test equipments can be adjusted to include requirements originally generated by component repair. The new input file, with the correct washout rates for the components, can then be rerun through the optimization to determine if a better maintenance concept is possible when the modules are considered as LRU's.

6.2.3 Fixed Price Repair

Except for test equipments and special repairmen, the OSAMM computes the cost to repair an item based on the common labor rate and the cost of repair parts. Occasionally, the cost to repair an item is given in terms of a fixed cost per repair action at the depot or contractor repair facility. This can be modeled with the OSAMM by considering all costs in the common labor calculation. Since the fixed cost includes repair parts, the parts costs input to the model should be $Ø.Ø1. A test equipment costing $1.ØØ which is allowed only at the depot should be listed with the item to force repair at the depot. The fixed repair cost is divided by the effective labor rate at the depot, and the resulting value entered as the MTTR for the item. The model will multiply the MTTR times the effective labor rate to get the "labor" cost which is charged for each repair action. The model will also charge for stockage of repair parts and the test equipment at the depot, but these costs will be insignificant.

Implementation of the procedure outlined above is slightly different for components and modules. If the item is a module, the parts cost per repair action is simply set to Ø.Ø1 and the number of parts needing an NSN is set to Ø. Implementation is more complicated when the item in question is a component. A pseudo module and an application must be created. The price of parts replaced in a repair action entered with the pseudo module must be Ø.Ø1, the number of total parts set to 1, and the number of new parts set to Ø. The application should be the only application for the component.

6.2.4 Test Equipments and Repairmen Entered Twice for the Same Repair

If the same test equipment or special repairman is entered with a component and an application involving that component the OSAMM preprocessor will generate an error message. A similar message is printed when a test equipment or repairman that has been entered as needed for every end item repair action is entered as necessary when a specific component fails. These messages are printed because the model will consider both requirements when computing the total requirement for the test equipment or repairman. As an example, suppose that a test equipment was needed for one hour every time a component failed. If it was also input as needed for one hour with a specific application involving the component, the model would charge the test equipment for two hours when the module in that application caused the failure.

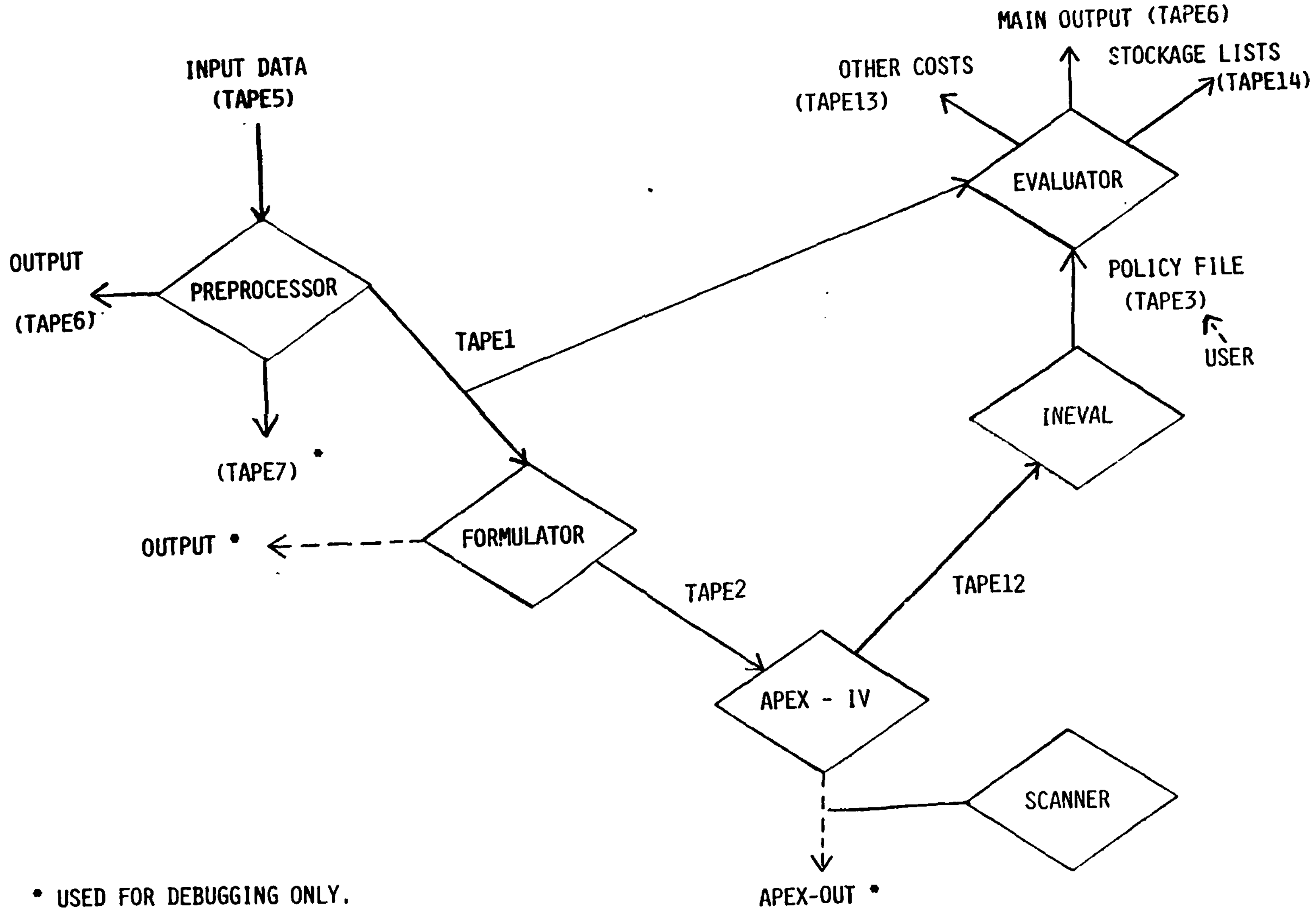
There are a few cases where a test equipment or special repairman may be listed both with the component and with an application. If the test equipment or special repairman is normally needed for a certain amount of time every time the component fails and is needed for an additional period of time when the failure is caused by a specific module, the test equipment or special repairman may be listed with the component and with the application defined by the component and module. The "time used" entered with the application should only be the additional time the test equipment or special repairman is needed. The same procedure may be followed for a test equipment or special repairman needed for every end item repair action and for an extra amount of time when the failure is caused by a specific component. The error message printed in either case can be ignored.

6.3 INSIDE THE MODEL

The information presented below deals with the internal workings of the OSAMM. Most of what is discussed here is done automatically by the model. The average user need not be concerned with these details, but analysts with a programming background may find them informative.

6.3.1 The OSAMM Programs

The OSAMM actually consists of several separate computer programs each of which has a different function. The programs are linked together by various intermediate files. The programs and connecting files are pictured in Figure 4. The first program is the preprocessor which is described in Chapter 3. The preprocessor feeds data to the formulator. This program formulates a mixed integer linear programming problem that can be solved by a standard software package. Currently, the OSAMM uses the APEX-IV package. The APEX-IV output is not normally seen by the average user. It is scanned, however, by a small program which generates the message which describes the performance of the optimization. The solution to the linear program is output as a policy file. Unfortunately, the policy file created by APEX-IV is written in binary code. The INEVAL program translates this files into the policy file that is discussed in section 5.2.



* USED FOR DEBUGGING ONLY.

FIGURE 4 - OSAMM PROGRAMS AND CONNECTING FILES

The last OSAMM program is the evaluator. This program takes the policy file from the optimization and combines it with cost data from the preprocessor to calculate the costs associated with the maintenance concept defined by the policy file. In the evaluation mode the preprocessor and evaluator are run with a policy file generated by the user. The evaluator produces the output files described in Chapter 4 and the corrected policy file described in Chapter 5.

6.3.2 The Equipment Stack

The preprocessor produces a second output file which is used primarily for debugging. Part of this file is the equipment stack. The equipment stack describes how test equipments and special repairmen are used when specific failures occur. Components, modules and applications are identified by reference number for this list. The integer part of each entry is the test equipment or special repairman identification number. The fractional part is the reciprocal of the number of repair actions the test equipment or special repairman can perform in one year.

Test equipments and special repairmen are not grouped in the same manner as they are input for this output. A test equipment or special repairman listed with a component is needed to repair the end item when that component fails (Sec 1.3a or 1.3b). Test equipments and special repairmen listed with a module are used to repair that module (See 1.3d). Finally, test equipments and special repairmen listed with an application are used to repair the component when the module fails (See 1.3c or 1.3e). These groupings are necessary because the model works with applications. A test equipment or special repairman used to repair a component every time it fails is input with the component. Since the module works with applications, however, this test equipment or special repairman must be listed with every application involving that component. Similarly, an equipment or repairman used to repair the end item must be associated with the component that has caused the failure. If an equipment or repairman is needed every time the end item fails, it must be associated with every component since the failure of any component will mean that the test equipment or special repairman is needed. The preprocessor performs these manipulations automatically, and it is not essential for the user to understand the details of the groupings.

6.3.3 Size Restrictions

The numbers of components, modules, applications, test equipments, and special repairmen that can be input to the OSAMM are limited by the size of the DIMENSION statements in the individual programs. The nominal values for these limits, which should be sufficient for almost all systems being modeled, are given at the beginning of Appendix C. Since raising these limits can cause significant increases in run time, they will only be adjusted by the model developers on a case by case basis.

REFERENCES

1. Kaplan, Alan J. and Orr, Donald A., "Optimum Supply and Maintenance Model Technical Documentation," AMSAA Army Inventory Research Office, Philidelphia, May 1987.

2. Kaplan, Alan J., "Mathematics of SESAME Model," AMSAA Army Inventory Research Office, Philadelphia, February 1980.

3. AMC Pamphlet 700-18, "User's Guide for the Selected Essential-Item Stockage for Availability Method (SESAME) Program," 29 July 1983.

4. DoDI 7041.3, "Economic Analysis and Program Evaluation for Resource Management," October 1972.

APPENDIX A

INPUT VARIABLE DEFINITIONS

1. Control Parameters

IMODE: Run mode selector. Run mode 0 is a standard run which does not consider screening and allows for one repair alternative. Run mode 1 is a screening run which considers one repair alternative and examines the cost effectiveness of screening. Run mode 2 examines multiple repair alternatives but does not consider screening.

IPOL: This series of variables defines the echelons that the model is permitted to select for different types of repair actions. For example, if the lowest echelon to repair components is 3 (GSU), then the model will only consider policies that have component repair at GSU or Depot. The lowest level to repair the end item must be a 1 or 2, and no screening is permitted at the organizational level.

DISCOUNT RATE: The discount rate used to compare one-time and annual recurring costs. As per DoDI 7041.3 a discount rate of 10% should be used.

INPUT CURVE PARAMETER: The input curve parameter to be used for special analysis. Normally, this field is left blank, and the model automatically selects the proper curve parameter.

CURVE PARAMETER MULTIPLIER: The selected curve parameter is multiplied by this factor for special analysis. Normally, the field is left blank, and the selected curve parameter is unchanged.

2. End Item Information

END ITEM IDENTIFICATION: Alphanumeric identification of the end item.

END ITEM UNIT PRICE: The unit purchase price of one end item.

LIFE: The expected number of years the end item is to be supported. The value is used in the comparison of one-time costs and annual recurring costs. *

ANNUAL OPERATING HOURS: The number of hours that the end item operates in one year. This value is used to convert mean time between failure data into failures per year. *

END ITEM MEAN TIME BETWEEN FAILURES (MTBF): The MTBF of the end item in hours. This value is used in the computation of operational availability.

END ITEM MEAN TIME TO REPAIR (MTR): The average time it takes in hours for end item repair. Include in this variable the time required to transport the end item to the organization or the time it takes organizational personnel to travel to the user. This time is used in the computation of operational availability and as a default for test equipment and special repairman requirements.

* Indicates possible government furnished data.

AVAILABILITY TARGET: The desired operational availability of the end item.

UNSERVICEABLE RETURN RATE (URR): In principle, the net demand on the wholesale level should reflect only system washouts--as everything else should be repaired. Experience indicates, to the contrary, that net demand on the wholesale level is ordinarily greater than would be expected from estimated washout rates. This is usually due to the fact that not all depot repairable items are returned for repair. In order to correct for this, OSAMM and SESAME, as well as ARCSIP and RDES, use an unserviceable return rate (URR) which is intended as an estimate of the ratio of unserviceable returns to the wholesale level to total demands on the wholesale level. The URR, in conjunction with the washout rate and the MTD for the depot, enables the SESAME algorithms to estimate the net wholesale demand. This input variable is not currently used by the OSAMM but is reserved for future releases of the model. Once certain policy issues concerning how the URR should be considered in the optimization are resolved, this input will become active. It cannot be used as it currently is by SESAME since it would unduly bias repair level decisions away from the depot.

FALSE REMOVAL RATE DEFAULT: The fraction of removals of operational items. This value, input with the end item information, represents the overall false removal rate associated with the end item and will be used when a specific false removal rate is not input with individual components and modules. Failure rates are increased by this fraction to reflect the burden placed on the maintenance and supply system by removal of operational components and modules.

MTBF MULTIPLIER: All MTBF's, including the end item, are multiplied by this factor. This variable is used in performing sensitivity analysis.

3. Turnaround Time (TAT) Defaults and End Item Repair Information

TAT DEFAULTS: These values, input with the end item, will be used when turnaround times are not input with individual components and modules. Turnaround time is the average elapsed time from the arrival of a failed component or module at the maintenance echelon where it is to be repaired until it is repaired and ready for use. This time includes administrative waiting time, processing time, and actual repair time. It does not include shipping time. Shipping time is assumed to be equal to the OST and will be added internally by the model. Waiting time for parts to repair a module or modules to repair a component will also be added internally by the model and should not be included here.

HOW MANY END ITEM REPAIR ALTERNATIVES: This variable tells the preprocessor how many end item repair alternatives are going to be input. If there are no test equipments or repairmen needed for end item repair this variable may be set to 0. Unless IMODE is equal to 2, this variable must be less than or equal to 1.

ARE THERE END ITEM REPAIR EQUIPMENT OR REPAIRMEN ASSOCIATED WITH SPECIFIC COMPONENTS: This variable should be set to 1 if there are test equipments or repairmen needed to repair the end item only when specific

* Indicates possible government furnished data.

components fail as described in paragraph 1.3b. If it is set to zero, the preprocessor will not expect any such equipments or repairmen to be input. This is strictly an indicator type variable.

TAT DEFAULTS FOR SCREENING: These values, input with the end item only if IMODE is equal to 1, will be used when turnaround times for screening are not input with individual components and modules. Screening turnaround time is the average elapsed time from the arrival of a suspected failed component or module at the echelon where it is to be screened until it is screened and sent for repair or returned to stock and ready for use. This time includes waiting time, processing time, and actual screening time. It does not include shipping time. Shipping time is assumed to be equal to the OST and will be added internally by the model. *

SCREENING DETECTION FRACTION DEFAULT: This value, input with the end item only if IMODE is equal to 1, will be used when a detection fraction is not input with individual components and modules. The detection fraction is the fraction of false removals that are detected by screening. For example, if there are 100 actual failures and the false removal rate is .10, then there will be 110 total removals and 10 false removals. A detection fraction of .80 would mean that 8 of the 10 false removals would be detected. These items would be returned to stock, and 102 items would be sent on for repair.

4. End Item Repair Alternatives (Optional)

> Note: There must be one record (plus continuation record if necessary) for each end item repair alternative. No records are required if the number of repair alternatives input on the previous record is equal to 0.

ALTERNATIVE NAME: The four character alphanumeric identification of the repair alternative. This identifies the alternative to the preprocessor. Each end item repair alternative must have a unique identifier.

EQUIPMENT/REPAIRMAN NUMBER: The identification numbers of the test equipments or repairmen that are required. These test equipments and repairmen are used every time the end item fails as described in paragraph 1.3a.

TIME USED: The length of time each particular test equipment or repairman will be required is listed after the identification numbers. This time is used in conjunction with the available test hours to determine the number of repair actions the test equipment or repairman can perform in a year. If no time is input here, the end item MTR will be used.

PLUS: Continuation indicator. If a test equipment/repairman continuation record is necessary, a plus sign, "+", should be entered in this field.

* Indicates possible government furnished data.

5. End Item Repair Equipments/Repairmen Associated With Specific Components. (Optional)

Note: These records are required only if the indicator on the TAT and End Item Repair Information record is equal to 1. There must be one record (plus continuation record if necessary) for each component whose failure necessitates the use of additional test equipment or repairman under a given repair alternative. If this type of information is input it must be followed by a record with "9999" in the first four columns.

COMPONENT IDENTIFICATION: The four character alphanumeric identification of the component whose failure necessitates the use of test equipment or repairmen to repair the end item.

ALTERNATIVE NAME: The four character alphanumeric identification of the end item repair alternative under which these additional test equipments or repairmen are necessary. This identification must match the identification of a repair alternative that has been defined above.

EQUIPMENT/REPAIRMAN NUMBER: The identification numbers of the test equipments or repairmen that are required. These equipments and repairmen are used to repair the end item when the specific component fails as described in paragraph 1.3.b. Test equipments and repairmen used under this alternative every time the end item fails which have already been input should not be listed here. (see 6.2.4 for exceptions)

TIME USED: The length of time each particular test equipment or repairman will be required. This time is used in conjunction with the available test hours to determine the number of repair actions the test equipment or repairman can perform in a year. If no time is input here, the end item MTR will be used.

PLUS: Continuation indicator. If a test equipment/repairman continuation record is necessary, a plus sign, "+", should be entered in this field.

6. Deployment Information

RETAIL STOCKAGE CRITERION: The number of demands per year that must be experienced by a retail stock point to qualify for stockage of a spare of that part. It is usually six per year for all items except aircraft, missile systems, and ammunition which all require three. This number is the basis of Standard Initial Provisioning (SIP) stock.*

SUPPLY SYSTEM: The supply support system that is used by the SESAME algorithms in computing stockage levels. Under a vertical system (V), the GSU performs a normal supply mission. Under a non-vertical system (N), the GSU performs a maintenance function and stocks only those items removed and replaced at the GSU in quantities necessary

* Indicates possible government furnished data.

to provide shop stock. If an item is repaired by a GSU it is assumed that the item is being repaired for a DSU on a job order basis, and that it is returned immediately. The repair time is considered in computing DSU stock. Under a direct exchange system (D), the GSU is permitted to stock those items which are repaired at the GSU in addition the necessary shop stock. The additional items are stocked only if the number of issues at the GSU equals or exceeds the stockage criterion.*

NUMBER OF SHOPS AT...: The number of maintenance/supply shops at each echelon which supports the end item in the field. If there are no GS shops a zero should be entered in the GS field. In this case, all transportation costs and times between the DSU and depot will be based on data input in the DSU-GSU fields. The GSU-Depot fields should be left blank. Any data in these fields will automatically be reset to zero.*

DENSITY: The total number of end items which are fielded worldwide.*

ORDER SHIP TIME: The time between the initiation of a stock replenishment action and the receipt of the material by the requesting activity. In a non-vertical (N) or direct exchange (D) supply system the OST between DSU and Depot is taken to be the maximum of the OST's input for DSU-GSU and GSU-Depot. If there are no GS shops, the OST from DSU to depot will be taken from the DSU-GSU field. The GSU-Depot OST will be set to zero.*

PROCUREMENT LEAD TIME: The time it takes for the wholesaler to procure spares from the manufacturer.*

CONTACT TEAM DELAY TIME: The time it takes for a DSU contact team to travel to the organization or for the end item to be evacuated to the DSU for repair and returned to the user. In either case, repair is considered as being performed by the DSU. Do not include actual repair time in this variable since it will be added automatically. The contact team delay time is added to the end item downtime whenever the end item is repaired by the DSU.*

OPERATING LEVEL: The number of days worth of stock intended to sustain normal operation during the interval between receipt of replenishment shipment and submission of a subsequent replenishment requisition.*

7. Labor Rates and Transportation Information

UNLOADED (BASE) HOURLY RATE: The unloaded hourly labor rate for a common repairman. *

COMMON LABOR RATE LOADING FACTOR: This factor is used to load the common labor rate with benefits, overhead, etc. A loading factor of .5 yields a loaded rate of 1.5 times the base rate. *

PRODUCTIVITY FACTOR: This factor is used to compute an effective hourly rate from the loaded hourly rate. It accounts for a common repairman's non-productive time such as time on leave. Suppose, for

* Indicates possible government furnished data.

example, that the loaded rate is $20.00 per hour and the productivity factor is .85. The effective rate would then be $23.52 per hour (20/.85). *

DISTANCE BETWEEN...: The average one-way distance between maintenance echelons. *

TRANSPORTATION COST PER POUND PER MILE: The cost of shipping one pound one mile between echelons. *

8. Cost Parameters

INITIAL CATALOGING COST: The initial cost to obtain an NSN for a new item entering the inventory system. *

RECURRING CATALOGING COST: The annual cost of maintaining the new NSN in the inventory system after the first year. *

INITIAL BIN COST: The initial cost of adding a line to an authorized stockage list (ASL). *

RECURRING BIN COST: The annual administrative cost of stocking an item at an echelon. *

HOLDING COST FRACTION: Annual inventory holding costs are computed as a fraction of the dollar value of stock. These costs include obsolescence, loss, and storage. Interest costs are not included here since they are considered in the discount rate.

REQUISITION COST: The cost to process a requisition. It is assumed that every demand for an item results in a requisition. There is a limit, however, of twelve requisitions per item per year since it is assumed no one part will be ordered more than once a month. *

COST OF TECHNICAL DOCUMENTATION PER PAGE: The cost of one page of technical documentation.

9. Test Equipment Information

Record 1: Basic Information

TEST EQUIPMENT IDENTIFICATION NUMBER: A number between 1 and 30 which identifies the test equipment.

TEST EQUIPMENT NAME: Any name, up to 10 characters long, to identify the test equipment for the user.

ONE TIME DEVELOPMENT COST: The investment cost to develop the test equipment. If the test equipment has already been developed for this or another weapon system, the development cost is sunk and this variable should be 0. The entire development cost will be charged once, regardless of how many are required, if the test equipment is used at any echelon for any reason.

* Indicates possible government furnished data.

TEST EQUIPMENT LIFE: The expected life of the test equipment. If this life is less than the end item life, the test equipment will be replaced when it wears out. No salvage value is considered. (* only if common)

HIGHEST ECHELON AT WHICH PECULIAR: This variable tells the model where a test equipment is common and peculiar. An entry of 2 means the equipment is peculiar at Org and DSU but common at GSU and Depot. Integer requirements are computed for a test equipment where it is peculiar. An entry of 0 means the equipment is common everywhere. The requirements for a test equipment where it is common can be fractional. *

LOWEST ECHELON ALLOWED: The lowest echelon at which the test equipment will be authorized. An entry of 2, for example, means that the test equipment is not allowed at organizational level.

FOR REPAIR ONLY: This variable indicates test equipments that are used solely for repair and not for diagnostics (fault isolation) or screening. This means that test equipments coded for repair only are not used on false removals or washouts. Requirements for these test equipments will be based only on actual failures which can be repaired.

Record 2: Information by Echelon.

UNIT PRICE: The per unit purchase price of a piece of test equipment. The amount of test equipment will be determined by the model. Research and development costs for the test equipment should not be included here. (* only if common)

ANNUAL MAINTENANCE FACTOR: This factor will be multiplied by the test equipment purchase price to yield the annual cost to maintain the test equipment. Test equipment maintenance costs are treated in this simple manner to limit the input data required to run the model. (* only if common)

AVAILABLE TEST HOURS PER YEAR: Requirements for a test equipment are based on the available test hours and the time required for each type of repair action it must perform. For example, if there are 2000 available test hours one piece of this test equipment can perform 4000 repair actions that take .5 hours or 2000 repair actions that take 1 hour. (* only if common)

ONE TIME INSTALLATION: Any one-time, per unit cost such as installation associated with a piece of test equipment. (* only if common)

* Indicates possible government furnished data.

10. Repairman Information:

Record 1: Basic Information

REPAIRMAN IDENTIFICATION NUMBER: A number between 1 and 30 which identifies the repairman. A repairman and a test equipment cannot have the same identification number.

REPAIRMAN NAME: Any name, up to 10 characters long, to identify the repairman for the user.

HIGHEST ECHELON AT WHICH PECULIAR: Same as for test equipment.

LOWEST ECHELON ALLOWED: Same as for test equipment.

FOR REPAIR ONLY: Same as for test equipment.

Record 2: Information by Echelon.

ANNUAL SALARY: The base (unloaded) salary of the repairman. *

MILITARY/CIVILIAN INDICATOR: A variable to indicate whether a repairman is military or civilian. Military and civilian repairmen have different default values for salary loading factor and turnover rate.

SALARY LOADING FACTOR: This factor is used to load the annual salary of the repairman with benefits, overhead, etc. A loading factor of .5 yields a loaded salary of 1.5 times the basic salary. *

TRAINING COST: The cost of training each repairman. *

TURNOVER: The average length of time the repairman stays at the same maintenance location. After this period of time a new repairman must be trained. *

AVAILABLE TEST HOURS: Same as for test equipment. The available test hours for a repairman are only those actually available to perform repair. Time for administrative and other duties as well as any non productive time such as leave should not be included. Productivity factors may be considered in developing this value. *

11. Component Information.

Record 1: Basic Information

COMPONENT IDENTIFICATION: The four character alphanumeric identification of the component. This identifies the component for use in the preprocessor. Each component must have a unique identifier.

COMPONENT NAME: Any name, up to 10 characters long, to identify the component for the user.

UNIT PRICE: The unit price that one expects to pay for spare components.

* Indicates possible government furnished data.

PACKAGED SHIPPING WEIGHT: The packaged shipping weight of the component.

ESSENTIALITY CODE: A component coded 1, 5 or 7 is essential to the operation of the end item. A component coded 3, 6 or blank is not essential and is not considered in the availability computation.

DOES THE COMPONENT HAVE AN NSN: This is an indicator variable which should be set to one (1) if the component has an existing NSN. If it is zero, no NSN exists and the cost of acquiring one is incurred.

WASHOUT RATE: The fraction of failures that are non-reparable because of physical damage, loss, etc. This fraction is used to compute replenishment spares.

FALSE REMOVAL RATE: The fraction of removals of operational items. Failure rates are increased by this fraction to reflect the burden placed on the maintenance and supply system by removal of operational components. If no value is input here the false removal rate default that was input with the end item information will be used.

TURNAROUND TIME (TAT): The average elapsed time from the arrival of a failed component at the maintenance echelon where it is to be repaired until it is repaired and ready for use. This time includes administrative waiting time, processing time and actual repair time. It does not include shipping time. Shipping time is assumed to be equal to the OST and will be added internally by the model. Waiting time for modules to repair the component will also be added internally and should not be entered here. If no values are input here, the turnaround times that were input with the end item information will be used. *

NUMBER OF REPAIR ALTERNATIVES: This variable tells the preprocessor how many repair alternatives are going to be input for this component. This number should be 1 unless IMODE is equal to 2 (multiple repair alternative run).

CAN THE COMPONENT BE SCREENED: This indicator variable should be set to 1 if the component is a candidate for screening (IMODE = 1). If this variable is equal to 1, the preprocessor will look for a record with screening information (Record 3 below).

Record 2, 3, or 4: Repair Information

> Note: There must be one record (plus continuation if necessary) for each component repair alternative. There must be at least one repair alternative defined for each component.

ALTERNATIVE NAME: The four character alphanumeric identification of the repair alternative. This identifies the repair alternative to the preprocessor and the user. Each repair alternative for a [illegible] component must have a unique identifier. The same name may be used for different components, however.

* Indicates possible government furnished data.

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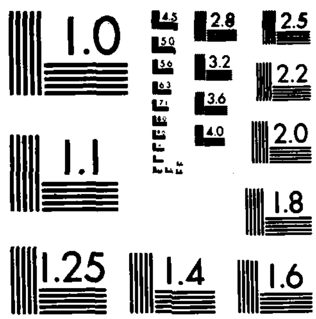

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

MEAN TIME TO REPAIR (MTTR): The average amount of time required to repair the component under the repair alternative. Component repair consists of isolation to and removal and replacement of a faulty module. Thus, the MTTR should include diagnostic time. If no special repairmen are required, the MTTR will be multiplied by the effective common rate to yield the labor cost associated with each repair action. This time will also be used to compute test equipment requirements if no time is input with the individual test equipment.

DIAGNOSTIC TIME: The time required to fault isolate the component to the module level under this repair alternative. This time does not include time for corrective action. Washouts and false removals will be charged for this diagnostic time only.

NUMBER OF PAGES OF TECHNICAL DOCUMENTATION: The number of pages of technical documentation that must be purchased under this repair alternative if the component is repaired. This cost is incurred only if the component is repaired.

TEST PROGRAM SET (TPS) DEVELOPMENT COST: One-time, up front costs associated with the development of a TPS to repair the component if a TPS is required under this repair alternative. These costs, primarily software development, are identified with the specific component. As with technical documentation, if the component is discarded at failure these costs will not be incurred. If an interconnect device (ICD) is used solely for this component its development cost should be included here. Shared interconnect devices requiring extensive development should be regarded as test equipment and their overall development cost should be input with the test equipment information. Only development costs which would be incurred if this specific component is repaired and not incurred if the component is not repaired should be included here.

ANNUAL TPS MAINTENANCE COST FACTOR: This factor will be multiplied by the initial development cost above to yield the annual cost to maintain the TPS.

EQUIPMENT/REPAIRMAN IDENTIFICATION NUMBER: The identification numbers of the test equipments and/or repairmen that are needed to repair the component every time it fails under this alternative are listed here.

TIME USED: The length of time each particular test equipment or repairman is required to repair the component is listed after the identification number. This time is used in conjunction with the available test hours to determine the number of component repairs the test equipment or repairman can perform in a year. If no time is entered here the component MTTR will be used unless the equipment or repairman is coded as for repair only. In that case, the time used will default to the MTTR minus the diagnostic time.

* Indicates possible government furnished data.

PLUS: Continuation indicator. If a test equipment/repairman continuation record is necessary, a plus sign, "+", should be entered in this field.

Record 5: Screening Information

> Note: This record is required only if the component is a candidate for screening as indicated on Record 1. (IMODE = 1 only).

SCREENING DETECTION FRACTION: The fraction of false removals that are detected by screening. For example, if there are 100 actual failures and the false removal rate is .10, then there will be 110 total removals and 10 false removals. A detection fraction of .80 would mean that 8 of the 10 false removals would be detected. Those items would be returned to stock, and 102 items would be sent on for repair. If no value is input here the detection fraction input with the end item information will be used.

SCREENING TIME: The average amount of time required to screen the component to determine if it has actually failed or if it is a false removal. The screening time will be multiplied by the effective common labor rate, if no special repairmen are required, to yield the labor cost associated with each screening action. If special repairmen are required this time will be used to compute their requirements when no time is input with the individual repairmen. This time will also be used to compute test equipment requirements if no time is input with the individual test equipment.

END TO END TPS DEVELOPMENT COST: One-time, up front costs associated with the development of TPS to perform a "go/no-go" test on the component. These costs, primarily software development, are identified with the specific component. If the component is not screened these costs will not be incurred. If an interconnect device (ICD) is used solely for screening this component, its development cost should be entered here. Shared interconnect devices requiring extensive development should be regarded as test equipment and their overall development cost should be input with the test equipment information. Only development costs which would be incurred if the specific component is screened and not incurred if the component is not screened, should be included here. Currently the model picks up TPS costs for screening if there is no repair. Otherwise, it assumes this development is part of the development of the repair TPS and costs are included in the repair TPS cost.

ANNUAL TPS MAINTENANCE COST FACTOR: This factor will be multiplied by the initial development cost above to yield the annual cost to maintain the end to end TPS.

TAT FOR SCREENING: Screening turnaround time is the average elapsed time from the arrival of a suspected failed component at the echelon where it is to be screened until it is screened and sent for repair or returned to stock. This time includes waiting time, processing

* Indicates possible government furnished data.

time, and actual screening time. It does not include shipping time. Shipping time is assumed to be equal to the OST and will be added internally by the model. If no values are input here, the turnaround times that were input with the end item information will be used. *

EQUIPMENT/REPAIRMAN IDENTIFICATION NUMBER: The identification numbers of the test equipments and/or repairmen that are needed to screen the component are listed here.

TIME USED: The length of time each particular test equipment or repairman is required to screen the component is listed after the identification number. If no time is entered here the screening time will be used.

PLUS: Continuation indicator. If a test equipment/repairman continuation record is necessary, a plus sign, "+", should be entered in this field.

12. Pseudo Component Information.

Record 1: Basic Information

COMPONENT IDENTIFICATION, COMPONENT NAME: Same as for regular components.

PRICE OF PARTS USED IN AVERAGE REPAIR ACTION: An average repair action of the end item when a pseudo component fails results in the replacement of some parts. The price of the parts replaced in an average repair action is entered here.

WEIGHT OF PARTS USED IN AVERAGE REPAIR ACTION: The packaged shipping weight of the parts replaced in an average repair action.

ESSENTIALITY CODE: Same as for regular components.

TOTAL NUMBER OF PARTS: The total number of parts that have been grouped together to form a pseudo component. A bin will be charged for each of these parts wherever the pseudo component is stocked.

NUMBER OF PARTS NEEDING NSN's: The number of parts described above which do not have an existing NSN.

TOTAL MTBF: The combined mean time between failures for all of the parts which make up the pseudo component. If MTBF(i) is the MTBF of part i, then the total MTBF, MTBF(t), is computed as follows:

$$1/MTBF(t) = 1/MTBF(1) + 1/MTBF(2) + \ldots + 1/MTBF(n)$$

where n is the total number of parts defined above.

FALSE REMOVAL RATE: Same as for regular components.

CAN THE COMPONENT BE SCREENED: Same as for regular components.

* Indicates possible government furnished data.

Record 2: Screening Information

Note: This record is required if the pseudo component is a candidate for screening (IMODE = 1 only). The definitions of variables on this record are identical to those for corresponding variables concerning screening regular components.

13. Module Information.

Record 1: Basic Information

IDENTIFICATION, NAME, PRICE, WEIGHT, ESSENTIALITY CODE, NSN, WASHOUT, FALSE REMOVAL, TAT, NUMBER OF ALTERNATIVES: Same as for components.

AVERAGE PRICE OF PIECE PARTS USED IN EACH REPAIR ACTION: A module repair action results in the replacement of piece parts. The cost of the parts used in an average repair action is entered here. This amount will be charged for each module repair action.

NUMBER OF PIECE PARTS NEEDING AN NSN: If the module is repaired, the cost of obtaining NSN's and opening bins for the new repair parts will be added. They will not be added if the module is thrown away.

CAN THE MODULE BE SCREENED: Same as for components.

Record 2, 3, or 4: Repair Information

Record 5: Screening Information

The definitions of all variables on these records are the same as those for the corresponding variables on the component records except that these inputs refer to repair of the specific module. Module repair consists of isolation to and removal and replacement of faulty piece parts.

14. Pseudo Module Information.

All pseudo module information is the same as the corresponding pseudo component information. The MTBF for a pseudo module is entered with application information, however.

15. Application Information.

Record 1: Basic Information.

COMPONENT IDENTIFICATION: The four character alphanumeric identification of the component. This identification must match the identification of a component which has been defined above.

* Indicates possible government furnished data.

MODULE IDENTIFICATION: The four character alphanumeric identification of the module. This identification must match the identification of a module which has been defined above.

MEAN TIME BETWEEN FAILURE (MTBF) OF THE MODULE IN THE COMPONENT: The MTBF of the module is entered here. If the module is part of several components, the MTBF must be entered separately for each application. Multiple occurrences of the module in the same component should be entered as one application with the MTBF's combined. The number of failures of the module in each component will be computed by the model and added to obtain the total number of module failures. In the case of a pseudo module, the total MTBF, which is computed in the same manner as described above for a pseudo component, is entered here.

NUMBER OF COMPONENT REPAIR ALTERNATIVES WHICH REQUIRE ADDITIONAL INFORMATION FOR THIS APPLICATION: General component repair information is input above with the component. In some cases, however, this information must be augmented or changed when the failure of the component is due to the failure of a specific module. This variable tells the preprocessor how many alternatives for repair of the component when the specific module listed on this record fails must be altered. This variable must be Ø or 1 unless IMODE is equal to 2. If this variable is greater than Ø the preprocessor will expect the next record(s) to contain the additional information.

Record 2: Additional Repair Information

> Note: There must be one record (plus continuation if necessary) for each component repair alternative which is to be augmented or changed. If no changes from the basic component repair information are needed (Number of repair alternatives which require additional information = Ø) no records of this type are necessary.

ALTERNATIVE NAME: The four character alphanumeric identification of the component repair alternative that is being modified. This must match the name of a repair alternative that was defined with the component information.

MTTR: The new component MTTR. The time to repair the component under this repair alternative when the specific module fails. A new MTTR would be input here if it were known that when this specific module failed it would take more or less time than normal to repair the component. If the repair time is the same as the component MTTR input with the component information under this repair alternative, this field should be left blank.

NUMBER OF PAGES OF TECHNICAL DOCUMENTATION SAVED: This variable is set to zero in standard usage. The number of pages of technical documentation that would not have to be purchased if the entire component was discarded when this specific module failed. This number of pages will be subtracted from the number of pages input

* Indicates possible government furnished data.

with the component information if the component is throwaway when the specific module fails. Normally this cost saving is negligible and this variable is set to 0.

EQUIPMENT/REPAIRMAN IDENTIFICATION NUMBER: The identification numbers of the test equipments and/or repairmen needed in addition to those listed with the component to repair the component under this alternative when the specific module fails. If a test equipment or repairman is listed with the component, it should not be listed here (see 6.2.4 for exceptions).

TIME USED: The length of time each particular test equipment or repairman is required to repair the component when the module fails is listed after the identification number. If no time is entered here the component MTTR (modified for this application as described above) will be used unless the equipment or repairman is coded for repair only. In that case, the time used will default to the MTTR minus the diagnostic time.

PLUS: Continuation indicator. If a test equipment/repairman continuation record is necessary, a plus sign, "+", should be entered in this field.

* Indicates possible government furnished data.

APPENDIX B

INPUT DATA FORMATS

This appendix lists the formats for each of the data records described in Chapter 2. Some of the variables have default values which will be used if a zero is input or if the data field for that variable is left blank. These values should be used only when better data is not available. The correct values for these variables may change, but the defaults may not reflect the change for some time.

All data entries should be right justified in their fields except for alphanumeric variables which should be left justified. The decimal point will automatically be placed so that the entry has the number of decimal places indicated. The user may insert his own decimal point which will override the assumed decimal point, however.

As an example, suppose the variable SAMPLE is to be input in columns 25-30 with 2 decimal places. The following

column	25	26	27	28	29	30
			1	0	2	5

would set SAMPLE equal to 10.25. The following

column	25	26	27	28	29	30
	2	5	.	3	7	5

would set SAMPLE equal to 25.375.

CONTROL PARAMETERS

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
IMODE	Ø-NORMAL 1-SCREEN 2-MULTIPLE	Ø	1	I
IPOL - LOWEST ECHELON TO				
REPAIR END ITEM	1 OR 2		3	I
REPAIR COMPONENTS	1,2,3 OR 4		4	I
REPAIR MODULES	1,2,3 OR 4		5	I
SCREEN COMPONENTS (IMODE = 1)	2,3 OR 4		6	I
SCREEN MODULES (IMODE = 1)	2,3 OR 4		7	I
DISCOUNT RATE	N/A	.1Ø	9-1Ø	2
INPUT CURVE PARAMETER	N/A	Ø	12-21	Ø
CURVE PARAMETER MULTIPLIER	N/A	1.Ø	22-26	2

END ITEM INFORMATION

.ARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
END ITEM IDENTIFICATION	ALPHANUM		1-10	
END ITEM UNIT PRICE	DOLLARS		12-21	0
LIFE	YEARS		23-25	I
ANNUAL OPERATING HOURS	HOURS		27-33	0
END ITEM MTBF	HOURS		35-41	0
END ITEM MTR	HOURS	.50	43-47	2
AVAILABILITY TARGET	N/A		49-51	3
COMPONENT AND MODULE UNSERVICEABLE RETURN RATE (NOT CURRENTLY USED, SEE APPENDIX A)	N/A		53-55	2
FALSE REMOVAL RATE DEFAULT (USED WHEN RATE NOT INPUT WITH COM/MOD)	N/A	.10	57-59	2
MTBF MULTIPLIER	N/A	1.00	61-65	2

TAT DEFAULTS AND END ITEM REPAIR INFORMATION
(DEFAULTS USED WHEN DATA IS NOT INPUT
WITH INDIVIDUAL COMPONENTS ANS MODULES)

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
TURNAROUND TIME (TAT) DEFAULTS (USED WHEN TAT NOT INPUT WITH COM/MOD)	DAYS			
ORG			1-3	Ø
DSU			5-7	Ø
GSU			9-11	Ø
DEPOT			13-15	Ø
HOW MANY END ITEM REPAIR ALTERNATIVES	N/A	Ø	17	I
ARE THERE END ITEM REPAIR EQUIP/REPMAN ASSOCIATED WITH SPECIFIC COMPONENTS	1 - YES Ø - NO	Ø	19	I
TAT DEFAULTS FOR SCREENING (IMODE = 1) (USED WHEN TAT NOT INPUT WITH COM/MOD)	DAYS			
ORG			21-23	Ø
DSU			25-27	Ø
GSU			29-31	Ø
DEPOT			33-35	Ø
SCREENING DETECTION FRACTION DEFAULT (USED WHEN NOT INPUT WITH COM/MOD)	N/A		37-39	2

END ITEM REPAIR ALTERNATIVES (OPTIONAL)
(ONE RECORD FOR EACH ALTERNATIVE)

.RIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
ALTERNATIVE NAME	ALPHANUM		1-4	
EQUIPMENT/REPAIRMAN ID NUMBER			10-11	I
TIME USED	HOURS	EI MTR	12-16	2
EQUIPMENT/REPAIRMAN ID NUMBER			17-18	I
TIME USED	HOURS	EI MTR	19-23	2
EQUIPMENT/REPAIRMAN ID NUMBER			24-25	I
TIME USED	HOURS	EI MTR	26-30	2
EQUIPMENT/REPAIRMAN ID NUMBER			31-32	I
TIME USED	HOURS	EI MTR	33-37	2
EQUIPMENT/REPAIRMAN ID NUMBER			38-39	I
TIME USED	HOURS	EI MTR	40-44	2
EQUIPMENT/REPAIRMAN ID NUMBER			45-46	I
TIME USED	HOURS	EI MTR	47-51	2
EQUIPMENT/REPAIRMAN ID NUMBER			52-53	I
TIME USED	HOURS	EI MTR	54-58	2
UIPMENT/REPAIRMAN ID NUMBER			59-60	I
.ME USED	HOURS	EI MTR	61-65	2
EQUIPMENT/REPAIRMAN ID NUMBER			66-67	I
TIME USED	HOURS	EI MTR	68-72	2
EQUIPMENT/REPAIRMAN ID NUMBER			73-74	I
TIME USED	HOURS	EI MTR	75-79	2
PLUS (IF LIST IS TO BE CONTINUED)	+	BLANK	80	

END ITEM REPAIR EQUIPMENTS/REPAIRMEN ASSOCIATED
WITH SPECIFIC COMPONENTS
(OPTIONAL)

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
COMPONENT IDENTIFICATION	ALPHANUM		1-4	
ALTERNATIVE NAME	ALPHANUM		6-9	
EQUIPMENT/REPAIRMAN ID NUMBER			10-11	I
TIME USED	HOURS	EI MTR	12-16	2
EQUIPMENT/REPAIRMAN ID NUMBER			17-18	I
TIME USED	HOURS	EI MTR	19-23	2
EQUIPMENT/REPAIRMAN ID NUMBER			24-25	I
TIME USED	HOURS	EI MTR	26-30	2
EQUIPMENT/REPAIRMAN ID NUMBER			31-32	I
TIME USED	HOURS	EI MTR	33-37	2
EQUIPMENT/REPAIRMAN ID NUMBER			38-39	I
TIME USED	HOURS	EI MTR	40-44	2
EQUIPMENT/REPAIRMAN ID NUMBER			45-46	I
TIME USED	HOURS	EI MTR	47-51	2
EQUIPMENT/REPAIRMAN ID NUMBER			52-53	I
TIME USED	HOURS	EI MTR	54-58	2
EQUIPMENT/REPAIRMAN ID NUMBER			59-60	I
TIME USED	HOURS	EI MTR	61-65	2
EQUIPMENT/REPAIRMAN ID NUMBER			66-67	I
TIME USED	HOURS	EI MTR	68-72	2
EQUIPMENT/REPAIRMAN ID NUMBER			73-74	I
TIME USED	HOURS	EI MTR	75-79	2
PLUS (IF LIST IS TO BE CONTINUED)	+	BLANK	80	

DEPLOYMENT INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
RETAIL STOCKAGE CRITERION	N/A		1	I
SUPPLY SYSTEM	V-VERTICAL N-NONVERT D-DX		2	
NUMBER OF SHOPS AT				
ORG			4-7	0
DSU			8-11	0
GSU			12-15	0
DENSITY			16-21	0
ORDER AND SHIP TIME	DAYS			
ORG-DSU			22-25	0
DSU-GSU			26-29	0
GSU-DEPOT			30-33	0
PROCUREMENT LEAD TIME	DAYS		34-37	0
CONTACT TEAM DELAY TIME	DAYS		38-41	0
OPERATING LEVEL	DAYS			
ORG			43-46	0
DSU			47-50	0
GSU			51-54	0

LABOR RATES AND TRANSPORTATION INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
UNLOADED (BASE) HOURLY RATE	DOLLARS			
ORG		7.25	1-4	2
DSU		10.30	5-8	2
GSU		21.00	9-12	2
DEPOT		21.00	13-16	2
LOADING FACTORS	N/A			
ORG		.90	18-19	2
DSU		.90	20-21	2
GSU		.45	22-23	2
DEPOT		.45	24-25	2
PRODUCTIVITY FACTORS	N/A			
ORG		.85	27-28	2
DSU		.85	29-30	2
GSU		.85	31-32	2
DEPOT		.85	33-34	2
DISTANCE BETWEEN	MILES			
ORG-DSU		7	36-41	0
DSU-GSU		250	42-47	0
GSU-DEPOT		3500	48-53	0
TRANSPORTATION COST PER POUND PER MILE	DOLLARS			
ORG-DSU		.01	55-61	5
DSU-GSU		.0004	62-68	5
GSU-DEPOT		.0004	69-75	5

COST PARAMETERS

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
INITIAL CATALOGING COST	DOLLARS	700	11-16	2
RECURRING CATALOGING COST	DOLLARS	175	18-23	2
INITIAL BIN COST	DOLLARS	238	25-30	2
RECURRING BIN COST	DOLLARS	38	32-37	2
HOLDING COST FRACTION	N/A	.06	43-44	2
COST PER REQUISITION	DOLLARS	26	46-51	2
COST OF TECHNICAL DOC. PER PAGE	DOLLARS	382	53-58	2

TEST EQUIPMENT INFORMATION
BASIC INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
TEST EQUIPMENT ID NUMBER	MAX 30		1-2	I
TEST EQUIPMENT NAME	ALPHANUM		4-13	
ONE TIME DEVELOPMENT COST	DOLLARS	0	15-24	0
TEST EQUIPMENT LIFE	YEARS	LIFE	26-27	I
HIGHEST ECHELON AT WHICH PECULIAR	0 - COMMON 1 - ORG 2 - DSU 3 - GSU 4 - DEPOT	0	29	I
LOWEST ECHELON AT WHICH ALLOWED	1 - ORG 2 - DSU 3 - GSU 4 - DEPOT	1	31	I
FOR REPAIR ONLY	1 - YES 0 - NO	0	33	I

TEST EQUIPMENT INFORMATION
PARAMETERS BY ECHELON

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
ORG				
UNIT PRICE	DOLLARS		1-7	0
ANNUAL MAINTENANCE FACTOR	N/A	.27	8-9	2
AVAILABLE TEST HOURS PER YEAR	HOURS		10-13	0
ONE TIME INSTALLATION	DOLLARS	0	14-20	0
DSU				
UNIT PRICE	DOLLARS		21-27	0
ANNUAL MAINTENANCE FACTOR	N/A	.27	28-29	2
AVAILABLE TEST HOURS PER YEAR	HOURS		30-33	0
ONE TIME INSTALLATION	DOLLARS	0	34-40	0
GSU				
UNIT PRICE	DOLLARS		41-47	0
ANNUAL MAINTENANCE FACTOR	N/A	.27	48-49	2
AVAILABLE TEST HOURS PER YEAR	HOURS		50-53	0
ONE TIME INSTALLATION	DOLLARS	0	54-60	0
DEPOT				
UNIT PRICE	DOLLARS		61-67	0
ANNUAL MAINTENANCE FACTOR	N/A	.27	68-69	2
AVAILABLE TEST HOURS PER YEAR	HOURS		70-73	0
ONE TIME INSTALLATION	DOLLARS	0	74-80	0

REPAIRMAN INFORMATION
BASIC INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
REPAIRMAN ID NUMBER	MAX 30		1-2	I
REPAIRMAN NAME	ALPHANUM		4-13	
HIGHEST ECHELON AT WHICH PECULIAR	0 - COMMON 1 - ORG 2 - DSU 3 - GSU 4 - DEPOT	0	15	I
LOWEST ECHELON ALLOWED	1 - ORG 2 - DSU 3 - GSU 4 - DEPOT	1	17	I
FOR REPAIR ONLY	1 - YES 0 - NO	0	19	I

REPAIRMAN INFORMATION
PARAMETERS BY ECHELON

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
ORG				
ANNUAL SALARY	DOLLARS		1-5	0
MILITARY/CIVILIAN INDICATOR	MIL/CIV 1 / 2		6	I
SALARY LOADING FACTOR	N/A	.9/.45	7-8	2
TRAINING COST	DOLLARS		9-13	0
TURNOVER	YEARS	2.5/5.	14-16	2
AVALIABLE TEST HOURS PER YEAR	HOURS		17-20	0
DSU				
ANNUAL SALARY	DOLLARS		21-25	0
MILITARY/CIVILIAN INDICATOR	MIL/CIV 1 / 2		26	I
SALARY LOADING FACTOR	N/A	.9/.45	27-28	2
TRAINING COST	DOLLARS		29-33	0
TURNOVER	YEARS	2.5/5.	34-36	2
AVALIABLE TEST HOURS PER YEAR	HOURS		37-40	0
GSU				
ANNUAL SALARY	DOLLARS		41-45	0
MILITARY/CIVILIAN INDICATOR	MIL/CIV 1 / 2		46	I
SALARY LOADING FACTOR	N/A	.9/.45	47-48	2
TRAINING COST	DOLLARS		49-53	0
TURNOVER	YEARS	2.5/5.	54-56	2
AVALIABLE TEST HOURS PER YEAR	HOURS		57-60	0
DEPOT				
ANNUAL SALARY	DOLLARS		61-65	0
MILITARY/CIVILIAN INDICATOR	MIL/CIV 1 / 2		66	I
SALARY LOADING FACTOR	N/A	.9/.45	67-68	2
TRAINING COST	DOLLARS		69-73	0
TURNOVER	YEARS	2.5/5.	74-76	2
AVALIABLE TEST HOURS PER YEAR	HOURS		77-80	0

COMPONENT INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
COMPONENT IDENTIFICATION	ALPHANUM		1-4	
COMPONENT NAME	ALPHANUM		5-14	
UNIT PRICE	DOLLARS		15-21	Ø
PACKAGED SHIPPING WEIGHT	POUNDS		22-27	2
ESSENTIALITY CODE	N/A		28	I
DOES THE COMPONENT HAVE AN NSN	1 - YES Ø - NO	Ø	29	I
WASHOUT RATE	N/A		31-34	3
FALSE REMOVAL RATE	N/A	SEE EI	35-36	2
TAT	DAYS			
ORG		TAKEN	37-39	Ø
DSU		FROM	40-42	Ø
GSU		EI	43-45	Ø
DEPOT		INFO	46-48	Ø
NUMBER OF REPAIR ALTERNATIVES (IF IMODE = Ø, DEFAULT IS 1)	N/A		49	I
CAN THE COMPONENT BE SCREENED (IMODE=1)	1 - YES Ø - NO	Ø	61	I

COMPONENT/MODULE REPAIR INFORMATION
(ONE RECORD FOR EACH ALTERNATIVE)

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
ALTERNATIVE NAME	ALPHANUM		1-4	
MTTR (INCLUDING DIAGNOSTIC TIME)	HOURS		6-10	2
DIAGNOSTIC TIME	HOURS		12-16	2
NUMBER OF PAGES OF TECHNICAL DOC	N/A	0	18-22	0
TPS DEVELOPMENT COST	DOLLARS	0	23-32	0
ANNUAL TPS MAINTENANCE COST FACTOR	N/A	0	33-34	2
EQUIPMENT/REPAIRMAN ID NUMBER			35-36	I
TIME USED	HOURS	MTTR ABOVE	37-41	2
EQUIPMENT/REPAIRMAN ID NUMBER			42-43	I
TIME USED	HOURS	MTTR ABOVE	44-48	2
EQUIPMENT/REPAIRMAN ID NUMBER			49-50	I
E USED	HOURS	MTTR ABOVE	51-55	2
EQUIPMENT/REPAIRMAN ID NUMBER			56-57	I
TIME USED	HOURS	MTTR ABOVE	58-62	2
EQUIPMENT/REPAIRMAN ID NUMBER			63-64	I
TIME USED	HOURS	MTTR ABOVE	65-69	2
EQUIPMENT/REPAIRMAN ID NUMBER			70-71	I
TIME USED	HOURS	MTTR ABOVE	72-76	2
PLUS (IF LIST IS TO BE CONTINUED)	+	BLANK	80	

SCREENING INFORMATION
(OPTIONAL, IMODE = 1 ONLY)

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
SCREENING DETECTION FRACTION	N/A	SEE EI	1-2	2
SCREENING TIME (SCRT)	HOURS		4-8	3
END TO END TPS DEVELOPMENT COST	DOLLARS		9-18	0
ANNUAL TPS MAINTENANCE COST FACTOR	N/A	0	19-20	2
TAT FOR SCREENING	DAYS			
ORG		TAKEN	21-23	0
DSU		FROM	24-26	0
GSU		EI	27-29	0
DEPOT		INFO	30-32	0
EQUIPMENT/REPAIRMAN ID NUMBER			35-36	I
TIME USED	HOURS	SCRT ABOVE	37-41	2
EQUIPMENT/REPAIRMAN ID NUMBER			42-43	I
TIME USED	HOURS	SCRT ABOVE	44-48	2
EQUIPMENT/REPAIRMAN ID NUMBER			49-50	I
TIME USED	HOURS	SCRT ABOVE	51-55	2
EQUIPMENT/REPAIRMAN ID NUMBER			56-57	I
TIME USED	HOURS	SCRT ABOVE	58-62	2
EQUIPMENT/REPAIRMAN ID NUMBER			63-64	I
TIME USED	HOURS	SCRT ABOVE	65-69	2
EQUIPMENT/REPAIRMAN ID NUMBER			70-71	I
TIME USED	HOURS	SCRT ABOVE	72-76	2
PLUS (IF LIST IS TO BE CONTINUED)	+	BLANK	80	

PSEUDO COMPONENT INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
COMPONENT IDENTIFICATION	ALPHANUM		1-4	
COMPONENT NAME	ALPHANUM		5-14	
PRICE OF PARTS USED IN AVERAGE REPAIR ACTION	DOLLARS		15-21	Ø
WEIGHT OF PARTS USED IN AVERAGE REPAIR ACTION	POUNDS		22-27	2
ESSENTIALITY CODE	N/A		28	I
TOTAL NUMBER OF PARTS	N/A		29-33	I
NUMBER OF PARTS NEEDING AN NSN	N/A		34-38	I
TOTAL MTBF	HOURS		39-48	Ø
FALSE REMOVAL RATE	N/A	SEE EI	49-5Ø	2
CAN THE COMPONENT BE SCREENED (IMODE=1)	1 - YES Ø - NO	Ø	51	I

MODULE INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
MODULE IDENTIFICATION	ALPHANUM		1-4	
MODULE NAME	ALPHANUM		5-14	
UNIT PRICE	DOLLARS		15-21	Ø
PACKAGED SHIPPING WEIGHT	POUNDS		22-27	2
ESSENTIALITY CODE	N/A		28	I
DOES THE MODULE HAVE AN NSN	1 - YES Ø - NO	Ø	29	I
WASHOUT RATE	N/A		31-34	3
FALSE REMOVAL RATE	N/A	SEE EI	35-36	2
TAT	DAYS			
ORG		TAKEN	37-39	Ø
DSU		FROM	4Ø-42	Ø
GSU		EI	43-45	Ø
DEPOT		INFO	46-48	Ø
NUMBER OF REPAIR ALTERNATIVES (IF IMODE = Ø, DEFAULT IS 1)	N/A		49	I
AVERAGE PRICE OF PIECE PARTS USED IN EACH REPAIR ACTION	DOLLARS		5Ø-55	2
NUMBER OF PIECE PARTS NEEDING AN NSN	N/A		56-6Ø	I
CAN THE MODULE BE SCREENED (IMODE=1)	1 - YES Ø - NO	Ø	61	I

PSEUDO MODULE INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
MODULE IDENTIFICATION	ALPHANUM		1-4	
MODULE NAME	ALPHANUM		5-14	
PRICE OF PARTS USED IN AVERAGE REPAIR ACTION	DOLLARS		15-21	Ø
WEIGHT OF PARTS USED IN AVERAGE REPAIR ACTION	POUNDS		22-27	2
ESSENTIALITY CODE	N/A		28	I
TOTAL NUMBER OF PARTS	N/A		29-33	I
NUMBER OF PARTS NEEDING AN NSN	N/A		34-38	I
FALSE REMOVAL RATE	N/A	SEE EI	49-5Ø	2
CAN THE MODULE BE SCREENED (IMODE=1)	1 - YES Ø - NO	Ø	51	I

APPLICATION INFORMATION

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
COMPONENT IDENTIFICATION	ALPHANUM		1-4	
MODULE IDENTIFICATION	ALPHANUM		5-8	
MTBF OF THE MODULE IN THE COMPONENT	HOURS		9-18	Ø
NUMBER OF COMPONENT REPAIR ALTERNATIVES WHICH REQUIRE ADDITIONAL INFORMATION FOR THIS APPLICATION		Ø	19	I

ADDITIONAL REPAIR INFORMATION FOR A GIVEN ALTERNATIVE

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
ALTERNATIVE NAME (MUST BE THE SAME AS AN ALTERNATIVE NAME LISTED WITH COMPONENT REPAIR INFO)	ALPHANUM		1-4	
MTTR	HOURS	COMP MTTR	6-10	2
NUMBER OF PAGES OF TECHNICAL DOC SAVED	N/A	0	12-16	I
EQUIPMENT/REPAIRMAN ID NUMBER			35-36	I
TIME USED	HOURS	COMP MTTR	37-41	2
EQUIPMENT/REPAIRMAN ID NUMBER			42-43	I
TIME USED	HOURS	COMP MTTR	44-48	2
EQUIPMENT/REPAIRMAN ID NUMBER			49-50	I
TIME USED	HOURS	COMP MTTR	51-55	2
EQUIPMENT/REPAIRMAN ID NUMBER			56-57	I
TIME USED	HOURS	COMP MTTR	58-62	2
EQUIPMENT/REPAIRMAN ID NUMBER			63-64	I
TIME USED	HOURS	COMP MTTR	65-69	2
EQUIPMENT/REPAIRMAN ID NUMBER			70-71	I
TIME USED	HOURS	COMP MTTR	72-76	2
PLUS (IF LIST IS TO BE CONTINUED)	+	BLANK	80	

EQUIPMENT/REPAIRMAN CONTINUATION RECORD
(USED AS NECESSARY)

VARIABLE	UNITS	DEFAULT	COLUMNS	DECIMAL
EQUIPMENT/REPAIRMAN ID NUMBER			1-2	I
TIME USED	HOURS		3-7	2
EQUIPMENT/REPAIRMAN ID NUMBER			8-9	I
TIME USED	HOURS		10-14	2
EQUIPMENT/REPAIRMAN ID NUMBER			15-16	I
TIME USED	HOURS		17-21	2
EQUIPMENT/REPAIRMAN ID NUMBER			22-23	I
TIME USED	HOURS		24-28	2
EQUIPMENT/REPAIRMAN ID NUMBER			29-30	I
TIME USED	HOURS		31-35	2
EQUIPMENT/REPAIRMAN ID NUMBER			36-37	I
TIME USED	HOURS		38-42	2
EQUIPMENT/REPAIRMAN ID NUMBER			43-44	I
TIME USED	HOURS		45-49	2
EQUIPMENT/REPAIRMAN ID NUMBER			50-51	I
TIME USED	HOURS		52-56	2
EQUIPMENT/REPAIRMAN ID NUMBER			57-58	I
TIME USED	HOURS		59-63	2
EQUIPMENT/REPAIRMAN ID NUMBER			64-65	I
TIME USED	HOURS		66-70	2
PLUS (IF LIST IS TO BE CONTINUED)	+	BLANK	80	

APPENDIX C

Preprocessor Parameter List

LSTK

Length of equipment stacks

VALUE: 2000

NAPPL

Number of possible applications

VALUE: 250

NCM

Number of possible components plus modules

VALUE: 300

NCOMP

Number of possible components

VALUE: 150

NSTE

Number of possible test equipments plus repairmen

VALUE: 30

NTOT

Total number of possible components plus modules plus applications

VALUE: 500

Preprocessor Variable List

Main Program

ALTNM(I,IA)

Name associated with repair alternative IA for the component, module or application with reference number I.

ALPHANUMERIC   4   CHARACTERS
INPUT

AVTAR

Availability target

REAL
INPUT

CF(K)

Annual maintenance cost factor for a test equipment at echelon K

REAL
INPUT for each test equipment
DEFAULT: .27

CHF

Factor used only in evaluator to remove holding cost from unit price

REAL
COMPUTED:
1.+ COSHOL * PVF

CLMULT(K)

Ratio of labor rate at echelon K to labor rate at ORG

REAL
COMPUTED:
RATL(K)/RATL(1)

COMTST(IEQ,I,IA)

Indicator for test equipment/repairman IEQ to repair component I under repair alternative IA

INTEGER
INTERNAL:
1 if equipment IEQ is used
Ø else

COSBI

Initial cost to open a bin

REAL
INPUT
DEFAULT: 238

```
COSBIN
      Present value of a bin
             REAL
             COMPUTED:
                      COSBI + PVF * COSBR

COSBR
      Annual recurring cost to maintain a bin
             REAL
             INPUT
             DEFAULT:  38

COSHOL
      Holding cost fraction
             REAL
             INPUT
             DEFAULT:  .06

COSNSI
      First year cataloging cost
             REAL
             INPUT
             DEFAULT:  700

COSNSN
      Present value of cataloging cost
             REAL
             COMPUTED:
                      COSNSI + COSNSR *
                      (PVF - .5 * (1. + 1./(1. + DIS)))

COSNSR
      Annual recurring cost to maintain an NSN
             REAL
             INPUT
             DEFAULT:  175

COSREQ
      Cost per requisition
             REAL
             INPUT
             DEFAULT:  26
             COMPUTED:
                      COSREQ = COSREQ * PVF

COSTD
      Cost of technical documentation per page
             REAL
             INPUT
             DEFAULT:  382
```

COSTRA(K)

Present value of transportation cost per pound between echelon K and echelon K + 1

REAL

COMPUTED:

CPM(K) * DIST(K) * PVF

CPM(K)

Transportation cost per pound-mile between echelon K and echelon K + 1

REAL

INPUT

DEFAULT: CPMD(K)

CPMD(K)

Default transportation cost per pound-mile between echelon K and echelon K + 1

REAL

INTERNAL

VALUES:

ORG-DSU	.01
DSU-GSU	.0004
GSU-DEPOT	.0004

CTDEL

DS contact team delay time in days

REAL

INPUT

CURIN

Input curve parameter

REAL

INPUT

DEFAULT: Model searches for curve parameter

CURMUL

Curve parameter multiplier

REAL

INPUT

DEFAULT: 1

DET(I)

Detection fraction for screening of item I where I is the reference number of the component or module

REAL

INPUT

DEFAULT: DETDEF

DETDEF

Screening detection fraction default

REAL

INPUT

DIAG(I,IA)

Diagnostic time for the component or module with reference number I under repair alternative number IA

REAL
INPUT

DIAGP(I,IA)

Fraction of MTTR of item I under alternative IA used for fault isolation

REAL
COMPUTED:

Components

DIAG(ILRU,IA)/MTTR(I,IA)

where

I = Reference number of application (failure mode)
IA = Alternative number
ILRU = Reference number of component

Modules

DIAG(I,IA)/MTTR(I,IA)

where

I = Reference number of module
IA = Alternative number

DIS

Discount rate

REAL
INPUT
DEFAULT: 0.10

DIST(K)

Distance in miles between echelons K and K + 1

REAL
INPUT
DEFAULTS: DISTD(K)

DISTD(K)

Default distance between echelon K and echelon K + 1

REAL
INTERNAL
VALUES:

ORG-DSU	7
DSU-GSU	250
GSU-DEPOT	3500

DMTBF

Derived MTBF

REAL
COMPUTED:

OH/FAILSUM

DOC(I,IA)

Cost of documentation to repair under repair alternative IA for the component, module, or application with reference number I

REAL

COMPUTED:

PAGE * COSTD

ECH

Echelon names for output

ALPHANUMERIC   3 CHARACTERS

INTERNAL

VALUES:

ORG, DSU, GSU, DEP, bbb

EIALTN(IA)

Name associated with end item repair alternative IA

ALPHANUMERIC   4   CHARACTERS

INPUT

EITEST(IEQ,IA)

Indicator for test equipment/repairman IEQ to repair end item under end item repair alternative IA

INTEGER

INTERNAL:

1 if equipment IEQ is used

0 else

EQCST(IEQ,K)

Present value of test equipment/repairman IEQ at echelon K

REAL

COMPUTED:

Test Equipment

EUP(K) + CF(K) * EUP(K) * PVF + STALL(K) + REPCST

Repairman

(SAL(K) * (1 + FL(K)) + TRMOS (K)/RTR(K)) * PVF

EQDEV(IEQ)

Development cost of test equipment IEQ

REAL

INPUT

DEFAULT: 0

EQSTK
List of test equipments/repairmen needed by component, module and application
REAL
INTERNAL
N.X
where
N = test equipment/repairman number
X = throughput = 1 divided by number of repair actions per year

ERR(I)
False removal rate for the component or module with reference number I
REAL
INPUT
DEFAULT: ERRDEF

ERRDEF
False removal rate default
REAL
INPUT
DEFAULT: 0.10

EUP(K)
Test equipment unit price at echelon K.
REAL
INPUT for each test equipment

FAIL(I)
Number of failures per end item per year of pseudo component with reference number I or of the module in the component which make up the application with reference number I.
REAL
COMPUTED: OH/(TBF * TBFACT)

FAILSUM
Sum of all failures
REAL
COMPUTED

FL(K)
Repairmen salary loading factor at echelon K
REAL
INPUT for each repairman
DEFAULTS: Military .90
Civilian .45

FLATE
Internal variable used to inflate default values.
REAL
INTERNAL
VALUE: 1.0

FNSN(I)
New NSN indicator/fraction for component or module with reference real number I.
REAL
INPUT: for components and modules
1 if has existing NSN
0 if does not have existing NSN
COMPUTED: for pseudo components and pseudo modules
1 - PARTSN/PARTST

HRS(K)
Available test hours for test equipment/repairman at echelon K.
REAL
INPUT for each test equipment/repairman

IA
Index for alternatives
INTEGER
INTERNAL

IALT(I)
Number of repair alternatives associated with the component, module, or application with reference number I.
INTEGER
INPUT

IAPP
Index number for application.
INTEGER
INTERNAL

IBEG
Index of starting point where entries are added to STK
INTEGER
INTERNAL

ID(I)
Identification of component or module with reference number I
ALPHANUMERIC 4 CHARACTERS
INPUT

IDD
Identification of component, used when end item repair equipments are input with specific components.
ALPHANUMERIC 4 CHARACTERS
INPUT

IDDL
Identification of component on application record
ALPHANUMERIC 4 CHARACTERS
INPUT

IDDS
Identification of module on application record
ALPHANUMERIC 4 CHARACTERS
INPUT

IDEI
End item identification.
ALPHANUMERIC 10 CHARACTERS
INPUT

IDL(IAPP)
Component number in application IAPP.
INTEGER
INTERNAL

IDLT
Temporary variable used in test for components with no modules.
INTEGER
INTERNAL

IDONE
Number of pseudo modules used to create dummy applications.
INTEGER
INTERNAL: NLRU-NLRUR

IDS(IAPP)
Module number (not reference number) in application IAPP.
INTEGER
INTERNAL

IDST
Temporary variable used in test for modules that are not used.
INTEGER
INTERNAL

IEQ
Index number for test equipment or repairman.
INTEGER
INPUT

IEQPEC(IEQ)
    Highest echelon at which test equipment or repairman IEQ is peculiar
        INTEGER
        INPUT
        DEFAULT: Ø

IEQPLA(IEQ)
    Lowest echelon at which test equipment or repairman IEQ can be placed.
        INTEGER
        INPUT
        DEFAULT: 1

IESS(I)
    Essentiality code of component or module with reference number I.
        INTEGER
        INPUT

IFIN
    Number of components, modules and applications.
        INTEGER
        INTERNAL: NLRU + NSRU + NAPP

IFIXON(IEQ)
    Indicator for fix only equipment.
        INTEGER
        INPUT: 1 If equipment or repairman IEQ is used for repair only.
               Ø If equipment or repairman IEQ is also used for fault isolation.
        DEFAULT: Ø

IFLAGA(IA)
    Special repairman flag used when repairmen are input with applications under repair alternative IA.
        INTEGER
        INTERNAL: 1 If a special repairman has been input.
                  Ø If no special repairman has been input.

IFLAGT
    Dummy variable for call to BLDSTK
        INTEGER
        INTERNAL

ILIFE
    Test equipment useful life.
        INTEGER
        INPUT
        DEFAULT: NLIFE

ILRU

Index for components.

INTEGER

INTERNAL

IMODE

Run mode indicator.

INTEGER

INPUT

DEFAULT: Ø

INDSTK(I,IA)

End of EQSTK for equipments and repairmen associated with repair of item I under alternative IA. If item I is a component, the equipments are for end item repair. If item I is a module, equipments are for module repair. If item I is an application, equipments are to repair the component when the module fails.

For screening:

IA = 2 - Screening equipments/repairmen

IA = 3 - Equipment/repairmen is used on false no go. Input with component or module and IFIXON = Ø. (e.g. a diagnostic equip).

INTEGER

INTERNAL

INSTK(I,IA)

End of STK for equipments/repairmen associated with repair of item I under alternative IA. If item I is a component, the equipments/repairmen are for component repair (all failures). If item I is a module, the equipments are for module repair. If item I is an application, equipments are to repair component when specific module fails.

For screening = See INDSTK

INTEGER

INTERNAL

INSTK1(IA)

End of STK for equipments/repairmen to repair end item every time it fails under alternative IA.

INTEGER

INTERNAL

IPECE

Temporary variable used as an index for output variable ECH.

INTEGER

INTERNAL: IEQPEC (IEQ)

IPLA
  Temporary variable used as an index for output variable ECH.
    INTEGER
    INTERNAL: IPLA = IEQPLA(IEQ)

IPLAM1
  Temporary variable for a loop.
    INTEGER
    INTERNAL: IEQPLA(IEQ)-1

IPOL(I)
  Policy Indicator.
    I=1 Lowest echelon to repair end item
    I=2 Lowest echelon to repair components
    I=3 Lowest echelon to repair modules
    I=4 Lowest echelon to screen components
    I=5 Lowest echelon to screen modules
    INTEGER
    INPUT

IPOSCR(I)
  Indicator for screening of component or module with reference number I.
    INTEGER
    INPUT: 1 If item I is a candidate of screening
    Ø If item I is not a candidate for screening
    DEFAULT: Ø

IREP
  Index used when buying test equipment if ILIFE is less than NLIFE
    INTEGER
    INTERNAL

IREPFL(IEQ)
  Repairman indicator for test equipment or repairman IEQ
    INTEGER
    INTERNAL: 1 If IEQ is a repairman.
    Ø If IEQ is a test equipment.

IREPL(I)
  Replication number for component or module with reference number I.
    INTEGER
    INTERNAL: 1 for real components and modules
    PARTST for pseudo components and modules

IRSC
  Retail stockage criterion.
    INTEGER
    INPUT

ISCR
  Dummy variable for calls to BLDSTK.
    INTEGER
    INTERNAL: 0

ISRT
  Starting position for reading test equipment or repairmen for CNTSTK
    INTEGER
    INTERNAL

ISRU
  Index (reference number) for modules
    INTEGER
    INTERNAL

ITEM
  Reference number for components and modules.
    INTEGER
    INTERNAL

IVSYS
  SESAME support system.
    ALPHANUMERIC 1 CHARACTER
    INPUT

LORN
  Component or module indicator.
    ALPHANUMERIC 1 CHARACTER
    INTERNAL

LS
  Component indicator.
    ALPHANUMERIC 1 CHARACTER
    INTERNAL: L

LSRUF
  Component or module flag
    INTEGER
    INTERNAL: 1 for components and modules
    0 for applications

MAXEQ
  Largest identification number of test equipments and repairmen.
    INTEGER
    INTERNAL

MAXSTK
  Index of last entry in EQSTK.
    INTEGER
    INTERNAL

MCTBF

Mean calendar time between failures.

REAL

COMPUTED: MTBF * 365.25/OH

MIL(K)

Military/civilian indicator at level K

INTEGER

INPUT for each repairman

MTBF

End item mean time between failures.

REAL

INPUT

MTR

End item mean time to repair.

REAL

INPUT

MTTR(I,IA)

Mean time to repair under alternative IA for pseudo component with reference number I or application with reference number I.

REAL

INPUT

NALT

Number of repair alternatives input with application where there is additional information.

INTEGER

INPUT

DEFAULT: Ø

NALTEI

Number of end item repair alternatives.

INTEGER

INPUT

DEFAULT: Ø

NALTN

Temporary alternative name used when inputing test equipments or repairmen to repair end item when specific components fail.

ALPHANUMERIC 4 CHARACTERS

INPUT

NAME(I)

Name of component or module with reference number I.

ALPHANUMERIC 1Ø CHARACTERS

INPUT

NAPP

Number of applications including those for pseudo components.

INTEGER

INTERNAL

NAPPT

Number of applications excluding those for pseudo components.

INTEGER

INTERNAL

NC3

Number of possible components times three.

INTEGER

INTERNAL: NCOMP * 3

NINE

Data separator check.

ALPHANUMERIC 4 CHARACTERS

INTERNAL: 9999

NITEMS

Number of components and modules

INTEGER

INTERNAL: NLRU + NSRU

NLE

Multiples of ILIFE used for buying test equipment in later years.

INTEGER

INTERNAL: ILIFE * IREP

NLIFE

Useful life of end item.

INTEGER

INPUT

NLRU

Number of components which have been input including pseudo components.

INTEGER

INTERNAL

NLRUR

Number of components which have been input excluding pseudo components.

INTEGER

INTERNAL

NNSTE

Index used for test equipment and repairmen inputs

INTEGER

INTERNAL: NSTE + 1

NS

Module indicator.

ALPHANUMERIC 1 CHARACTER

INTERNAL: N

NSPEC

Indicator for test equipments or repairmen used to repair end item when specific components fail.

INTEGER

INPUT: 1 If there are such equipment/repairmen

Ø If not.

DEFAULT: Ø

NSRU

Number of modules that have been input.

INTEGER

INTERNAL

NSTACK(I,IA)

Number of entries in EQSTK associated with repair of item I under alternative IA. If item I is a component, the equipments/repairmen are for end item repair. If item I is a module, equipments/repairmen are for module repair. If item I is an application equipments/repairmen are to repair the component when the module fails.

For screening:

IA = 2 screening equipment/repairmen

IA = 3 equipment/repairmen is used on false no go; input with component or module and IFIXON = Ø

INTEGER

INTERNAL

NSTK(I,IA)

End of STK for equipment/repairmen associated with repair of item I under alternative IA. If item I is a component, the equipments/repairmen are for component repair (all failures). If item I is a module, the equipments/repairmen are for module repair. If item I is an application, equipments are to repair component when specific module fails.

For screening:

See NSTACK

INTEGER

INTERNAL

NSTK1(IA)

Number of equipments/repairmen in STK to repair end item every time it fails under alternative IA.

INTEGER

INTERNAL

NTEMP

Temporary number of test equipments/repairmen used to repair end item when specific components fail.

INTEGER
INTERNAL

OH

Annual end item operating hours.

REAL
INPUT

OPL(K)

Operating level at echelon K.

REAL
INPUT

OST(K)

Order ship time in days between echelon K and echelon K + 1, K = 1,2,3. Procurement lead time, K = 4.

REAL
INPUT

OUPS(K)

Number of shops at echelon K, K = 1,2,3. Worldwide density, K = 4.

REAL
INPUT

OUP1

Operational units of program at echelon 1.

REAL
COMPUTED:
OUP(4)/OUP(1)

OUP2

Operational units of program at echelon 2

REAL
COMPUTED:
OUP(4)/OUP(2)

OUP3

Operational units of program at echelon 3.

REAL
COMPUTED:
OUP(4)/OUP(3)

PAGE

Pages of technical documentation

REAL
INPUT for each component and module

PARTSN

Number of parts in a pseudo component or pseudo module needing an NSN.

REAL
INPUT

PARTSP(I)

Average cost of parts used in each repair action of module with reference number I.

REAL
INPUT: set to Ø for components, pseudo components and pseudo modules.

PARTSR(I)

Number of parts needing an NSN on module with reference number I.

REAL
INPUT: Set to Ø for components, pseudo components and pseudo modules.

PARTST

Total parts in a pseudo component or pseudo module.

REAL
INPUT

PLUS

Continuation indicator for input of test equipment/ repairmen.

ALPHANUMERIC 1 CHARACTER
INPUT: + indicates more to follow.

PRODF(K)

Common labor productivity factor at echelon K

INPUT
DEFAULT: PRODFD(K)

PRODFD(K)

Common labor productivity factor default at echelon K

INTERNAL
VALUES:

ORG	Ø.85
DSU	Ø.85
GSU	Ø.85
DEPOT	Ø.85

PVF

Present value factor

REAL
COMPUTED:

```
.5 + (1. - (1. + DIS) ** (-NLIFE + 1))/DIS
+ .5 * (1. + DIS) ** (-NLIFE)
```

RATL(K)
    Common labor rate at echelon K.
        REAL
        INPUT
        DEFAULT: RATLD(K)
        COMPUTED:
            RATL(K) = RATL(K) * (1 + RATLF(K))/PRODF(K)

RATLD(K)
    Default common labor rate at echelon K.
        REAL
        INTERNAL
        VALUES:

ORG	7.25
DSU	10.30
GSU	21.00
DEPOT	21.00

RATLF(K)
    Common labor rate loading factor at echelon K
        INPUT
        DEFAULT: RATLFD(K)

RATLFD(K)
    Common labor rate loading factor default at echelon K
        INTERNAL
        VALUES:

ORG	.90
DSU	.90
GSU	.45
DEPOT	.45

REPC(I,IA)
    Cost to repair item with reference number I under alternative IA at ORG.
        For Screening:
            IA = 2 cost to screen
        REAL
        COMPUTED:
            TMTTR * RATL(1)
        Where:
            TMTTR = MTTR(I,IA) if there are no repairmen input
                  = 0 if repairman is input
        For Screening; IA = 2:
            SCRTT * RATL(1)
        Where:
            SCRTT = SCRT if there are no repairmen for screening.
                  = 0 if there are repairmen for screening.

REPCST

Test equipment replacement cost.

REAL

COMPUTED:

$$((1. + DIS) ** (1 - NLE) + (1. + DIS) ** (-NLE)) * .5 * EUP(K)$$

RTR(K)

Turnover period for repairman at echelon K.

REAL

INPUT for each repairman

DEFAULTS:

Military	2.5
Civilian	5.0

SAL(K)

Repairman annual salary at echelon K

REAL

INPUT for each repairman

SCRT

Screening time for a component or module.

REAL

INPUT for each component or module that is a candidate for screening

STALL(K)

Test equipment installation cost at echelon K.

REAL

INPUT for each test equipment

DEFAULT: 0

STENM(IEQ)

Name of test equipment or repairman IEQ.

ALPHANUMERIC 10 CHARACTERS

INPUT

STK

Temporary list of test equipments and repairmen needed by component, module, and application. Used to build EQSTK

REAL

INTERNAL: See EQSTK

TAT(I,K)

Turnaround time to repair component or module with reference number I at echelon K

REAL

INPUT

DEFAULT: TATDEF(K)

TATDEF(K)
Default turnaround time for repair at echelon K.
REAL
INPUT

TATSCR(I,K)
Turnaround time for screening component or module with reference number I at echelon K.
REAL
INPUT
DEFAULT: TATSCRD(K)

TATSCRD(K)
Default turnaround time for screening at echelon K.
REAL
INPUT

TBF
Mean time between failures for a given component or module
REAL
INPUT for each pseudo component and each application

TBFACT
MTBF multiplier.
REAL
INPUT
DEFAULT: 1.0

TEHR
Time test equipment or repairman is used. Used to build STK.
REAL
INPUT: See TEMHR
DEFAULT:
MTTR if IFIXON = 0
MTTR-DIAG if IFIXON = 1

TEMHR
Temporary variable to read TEHR. (To eliminate need to input number of test equipment or repairman types).
REAL
INPUT

TEMSTK
Temporary variable to build STK. (To eliminate need to input number of test equipment or repairman types).
REAL
INPUT

TERAT(K,IEQ)

Ratio of available test hours for test equipment or repairman IEQ at echelon K to available test hours at lowest allowable echelon.

REAL
COMPUTED:
HRS(K)/TESTHR(IEQ)

TESTHR(IEQ)

Available test hours for test equipment or repairman IEQ at lowest allowable echelon.

REAL
INTERNAL: HRS(IPLA)

TPS(I,IA)

Present value of the cost of a test program set to diagnose component or module with reference number I under alternative IA.

For screening:
IA = 2 cost of end to end TPS.

REAL
COMPUTED:
TPS(I,IA)=TPSI(I,IA)*(1.+TPSR(I,IA)*PVF)

TPSI(I,IA)

Development cost for test program set to diagnose component or module with reference number I under alternative IA.

For screening:
IA = 2 development cost of end to end TPS.

REAL
INPUT
DEFAULT: 0 (no TPS)

TPSR(I,IA)

Annual maintenance cost factor for test program set to diagnose component or module with reference number I under alternative IA.

For screening:
IA = 2 development cost of end to end TPS.

REAL
INPUT
DEFAULT: 0 (no annual maintenance cost)

TRMOS(K)

Training cost for repairman at echelon K.

REAL
INPUT for each repairman

UP(I)

Unit price of component or module with reference number I.

REAL

INPUT

COMPUTED:

UP(I) * CHF

UPEI

Unit price of end item.

REAL

INPUT

URR

Unservicable return rate.

REAL

INPUT

WASH(I)

Washout rate for component or module with reference number I

REAL

INPUT

WGT(I)

Weight of component or module with reference number I.

REAL

INPUT

YESNO

Yes or No for output.

ALPHANUMERIC 3 CHARACTERS

VALUES: NO, YES

APPENDIX D

PREPROCESSOR ERROR MESSAGES

The preprocessor has several error messages to aid in checking input data. The program may execute normally even though an error message is printed, but every error message should be investigated. In addition, any time a data field on the preprocessor output is filled with asterisks, the data for that field should be verified. The asterisks indicate that the number to be written in the field is too large. Since the data fields should be big enough to accommodate the entries that are supposed to fill them, asterisks usually indicate an error in the input data. There can be no asterisks on the data file that is passed to the main program. Incorrect data may cause warning or error messages that are not part of the preprocessor to be printed. These errors must also be investigated.

The preprocessor error messages and possible causes are as follows:

THE DISCOUNT RATE X.XX IS NOT STANDARD

The standard discount rate for present value calculations is 10%. If any other discount rate is input this message is printed.

OPERATING LIFE IS ZERO

The operating life of the end item has been set to zero. None of the cost calculations will be correct.

ONLY ONE END ITEM REPAIR ALTERNATIVE IS ALLOWED UNLESS IMODE IS 2

The number of end item repair alternatives on the TAT and End Item Repair Information record must be 0 or 1 unless IMODE = 2.

TIME FOR EQUIPMENT/REPAIRMAN XX IS XXX.XX WHICH IS GREATER THAN MTR

A "time used" for test equipment or repairman XX which is greater than the end item MTR has been entered. Since the test equipment/repairman is used for every end item repair action, the MTR should be at least as long as the time the equipment/repairman is required. The only exception to this occurs if the time entered actually represents the work of more than one repairman.

THIS END ITEM REPAIR ALTERNATIVE XXXX HAS NOT BEEN INPUT

Test equipments or repairmen to repair the end item when a specific component fails under repair alternative XXXX have been entered. Repair alternative XXXX, however, has not been defined as an end item repair alternative (see 2.4).

THIS TEST EQUIPMENT/REPAIRMAN XX IS USED FOR EVERY END ITEM REPAIR ACTION UNDER THIS ALTERNATIVE XXXX, IT SHOULD NOT BE ENTERED WITH INDIVIDUAL COMPONENTS

A test equipment or repairman to repair the end item when a specific component fails has been entered. This test equipment/repairman has already been entered as required for every end item repair. This will cause requirements for the test equipment/repairman to be doubled counted (See 6.2.4 for exceptions) .

TIME USED FOR EQUIPMENT/REPAIRMAN XX IS ZERO, END ITEM MTR WILL BE USED

No time used has been entered for test equipment/repairman number XX. The preprocessor assumes that it will be required for the end item MTR.

CLAIMANTS AT XXXX IS ZERO, DIVISION BY ZERO OCCURS

This message is printed if the claimants at organization or intermediate direct support is zero. There must be claimants at these levels.

COST BETWEEN XXXX AND YYYY IS ZERO

Order and ship times between all levels must be entered unless there are no GS shops in which case the OST between GSU and Depot can be zero.

COST CARD STARTS IN WRONG COLUMN, MUST HAVE BLANK CARD IF USING ALL DEFAULTS

The first ten columns of the cost data record must be left blank. If some other record is read as the cost data record, this error will occur. The cost data record must be included in the file even if it is blank (using all defaults).

EQUIPMENT NUMBER FIELD IS BLANK FOR EQUIPMENT WITH DEVELOPMENT COST XXXXXXXX.

Data for a test equipment was input without assigning an identification number. The messages gives the development cost to help locate the incorrect data.

UNIT PRICE IS ZERO FOR EQUIPMENT NUMBER XX

Equipment number XX has no unit purchase price.

EQUIPMENT NUMBER XX HAS ZERO AVAILABLE TEST HOURS AT ECHELON X

The number of available test hours for each test equipment must be input at each echelon where the test equipment is allowed. This value is used to compute test equipment requirements.

REPAIRMAN NUMBER FIELD IS BLANK

Data for a special repairman was input without assigning an identification number.

MILITARY/CIVILIAN INDICATOR IS BLANK FOR REPAIRMAN XX AT ECHELON X, ASSUMED TO BE MILITARY

This message reminds the user that since no indicator was input, the repairman will be considered as military. This assumption is important when defaults for turnover and loading factors are used.

TRAINING COST IS BLANK FOR REPAIRMAN XX AT ECHELON X

This message warns the user that the training cost for a special repairman is zero. While zero is a possible input, it is hardly realistic and should be reconsidered. The message identifies the repairman and the echelon where the error occurs.

REPAIRMAN NUMBER XX HAS ZERO AVAILABLE TEST HOURS AT ECHELON X

The number of available test hours for each special repairman must be input at each echelon where he is allowed. This value is used to compute requirements for the special repairman.

EQUIPMENT NUMBER XX IS COMMON ABOVE XXXX. SINCE DEVELOPMENT FOR COMMON EQUIPMENT IS NORMALLY A SUNK COST, DEVELOPMENT COST SHOULD USUALLY BE ZERO

If a test equipment is common at any echelon its development has most likely been completed. Therefore, the development cost is sunk and should not be considered in the repair level decision.

YOU HAVE ENTERED MORE THAN ONE REPAIR ALTERNATIVE FOR THE FOLLOWING ITEM XXXXXXXXXX, ONLY ONE REPAIR ALTERNATIVE IS PERMITTED IN A NORMAL OR SCREENING RUN

The number of repair alternatives for a component or module must be equal to 1 unless IMODE = 2.

THIS IS NOT A SCREENING RUN, IPOSCR FOR THIS ITEM XXXXXXXXXX HAS BEEN SET TO ZERO

A value other than zero has been entered in the field which designates an item as a candidate for screening. This only permitted in a screening run (IMODE = 1).

NUMBER OF REPAIR ALTERNATIVES FOR THIS ITEM XXXXXXXXXX IS NOT 1, 2, OR 3

The number of repair alternatives must be 1, 2 or 3. There cannot be more than three repair alternatives for each component or module. (IMODE = 2).

TOTAL REPAIR TIME FOR THIS ITEM XXXXXXXXXX IS LESS THAN DIAGNOSTIC TIME

The diagnostic time that has been entered is greater than the MTTR. Since the MTTR includes diagnostic time it should always be greater than the diagnostic time.

SCREENING TPS COST IS GREATER THAN REPAIR TPS COST FOR THIS ITEM XXXXXXXXX

The model assumes that an end to end TPS is developed as part of the repair TPS. Therefore, the repair TPS should be more costly to develop.

MTBF FOR PSEUDO COMPONENT XXXXXXXXXX IS ZERO DIVISION BY ZERO OCCURS

The MTBF for pseudo component XXXXXXXXXX has been read as zero. An MTBF must be entered for each pseudo component.

MTBF FOR PSEUDO MODULE XXXXXXXXXX MUST BE INPUT WITH AN APPLICATION

This message occurs when an attempt is made to input an MTBF for a pseudo module. As with regular modules, pseudo module failure information is input with application data.

THIS PSEUDO COMPONENT/MODULE XXXXXXXXXX HAS ZERO TOTAL PARTS, DIVISION BY ZERO OCCURS

A pseudo component or module must be comprised of at least one part. The preprocessor has read a value of zero for the total number of parts.

EQUIPMENT/REPAIRMAN SCREENING TIME IS ZERO FOR EQUIP/REP NUMBER XX, SCREENING TIME FOR XXXXXXXXXX WILL BE USED

No "time used" was entered for test equipment or repairman XX which is needed for screening. The model assumes that the test equipment/repairman is needed for the entire screening time which was input on the screening data record.

EQUIPMENT/REPAIRMAN XX HAS NOT BEEN INPUT, PROGRAM DIVIDES BY ZERO

A repair action has been defined which requires test equipment or repairman XX, but test equipment/repairman XX has not been defined. If the message lists test equipment/repairman number Ø, an error has occurred in specifying the identification number.

ILLEGAL RUN MODE CODE

A run mode other than Ø, 1 or 2 has been entered.

THIS COMPONENT ID XXXX DOES NOT MATCH ANY THAT HAVE BEEN INPUT, CHECK FOR TYPO ERROR

The component identification listed on an end item repair record or on an application record does not match the identification of any of the components that have been input. The component identification must be identical to the identification on the component information record.

THIS MODULE ID XXXX DOES NOT MATCH ANY THAT HAVE BEEN INPUT, CHECK FOR TYPO ERROR

The module identification on an application record does not match the identification of any of the modules that have been input. The module identification must be identical to the identification on the module identification record.

MTBF FOR APPLICATION NUMBER XXX IS ZERO, DIVISION BY ZERO OCCURS

The MTBF on an application record has been read as zero.

THE REPAIR ALTERNATIVE XXXX HAS NOT BEEN INPUT FOR THIS COMPONENT XXXXXXXXXX

An attempt has been made to modify component repair information by entering data with an application. The component repair alternative identified on this record does not match any of those that were input with component repair information.

TEST EQUIPMENT/REPAIRMAN XX IS USED FOR EVERY COMPONENT REPAIR ACTION UNDER THIS ALTERNATIVE XXXX, IT SHOULD NOT BE ENTERED WITH THE APPLICATION

A test equipment or special repairman to repair the component has been entered with the application. This test equipment/repairman has already been listed for every component repair action under the given alternative. This will cause requirements for the test equipment/repairman to be doubled counted (See 6.2.4 for exceptions).

ONLY ONE REPAIR ALTERNATIVE CAN BE CONSIDERED IN THIS RUN, TO EXAMINE MULTIPLE REPAIR ALTERNATIVES SET IMODE = 2

The number of component repair alternatives which require additional information for an application has been set to a number greater than 1, and the run mode is not set to examine multiple repair alternatives.

THIS MODULE XXXXXXXXXX IS NOT LISTED WITH AN APPLICATION, EACH MODULE MUST APPEAR IN AT LEAST ONE APPLICATION

The preprocessor has scanned all applications and the module listed does not appear in any of them. All modules, including pseudo modules, must appear in at least one application.

THIS COMPONENT XXXXXXXXXX HAS NO MODULES, EACH REPAIRABLE COMPONENT MUST HAVE AT LEAST ONE MODULE

If a component is repairable it must have a lower level of indenture (see 1.2). The preprocessor has scanned the applications to insure that at least one module is listed as the lower level of indenture for the component, and none has been found.

THIS ID XXXX HAS BEEN INPUT MORE THAN ONCE, CHECK FOR TYPO ERROR

The same alphanumeric identification has been assigned to two different components or modules. Each component and module must have a unique alphanumeric identification.

APPENDIX E

SAMPLE BASIC RUN

Sample input and output files from a basic run are contained in this appendix. While the data was derived from a real system, some of it has been modified to demonstrate certain features of the OSAMM. Thus, no data from this appendix should be used in any other analysis. Furthermore, the data in this appendix should not be compared to that in any of the other sample runs in this manual.

INPUT FILE

```
0 111
SINCGARS V        8325  15      730     1300     25 900 1          1
  1   3  30 120 0 0
6V  500 100  24199750   2  40   40 510 760   15   30   30
 70610593450345O 6868                                          01177  00034  00035
           65340  16247  22016    3532      03    2379   300
 1 COMMON EQ                15 1 2
  34990  1768
 2 BREAK BOX                15 4 2
    350 51768
 3 STATIC PAD               15 4 2
    100 11768
 4 REPAIR VAN               15 2 3
1160000101768
 5 ICD1                     15 4 3
    60412176B
 6 ICD 2                       4 3
    529121768
 7 ICD 3                       4 3
   1387101768
 8 ICD 4                       4 3
    179101768
 9 ICD 5                       4 3
   3622101768
10 IACFIREICD                  2 3
   1500121768
11 ICD 6                       4 3
    478121768
12 ICD 7                       4 3
    728121768
13 ICD 8                       4 3
    107121768
14 ICD 9                       4 3
    334101768
15 ICD 10                      4 3
    334101768
16 ICD 11                      4 3
    334101768
17 ICD 12                      4 3
    334101768
18 ICD 13                      4 3
    334101768
19 USM-410                     2 3
 800000101768
20 USM-465                     2 3
  4000010176B
21 ICD 14                      4 3
    425121768
22 ICD 15                      4 3
    390121768
99
99
1000RT            5163  10501     1                  1
ALTI     5          56              01       02      03
2000PWER AMP      1008    9501    1                  1
ALTI     5         144              04       16      19      21
3000ECCM           868     751   050                 1
ALTI     5        2975              04       05      20
5000VEH MOUNT     1960   42501    1                  1
ALTI     5          56              01       02      03
6000IVRCU          840    3501    1                  1
ALTI     5          56              01       02      03
9999
7000MAN ANT         76     8 1    1     1     14752
8000VEN ANT        112    2431    3     3      2726
9000HAT CASE       115    15 1    1     1     18440
```

```
9999
1001CHASIS        1409   5  1    5                 1  25       96
ALT1    5          779                4     09    20
1002CONTROL        382    421    5                 1  25       14
ALT1    5         1594              04      06    20
1003PWR ASSY       190    421    5                 1  25       13
ALT1    5          221              04      12    13      10        19
1004TUNER/MIX      394    421    5                 1  25       28
ALT1    5          193              04      10    11      19
1005IF DEMOD       359    421    5                 1  25       19
ALT1    5          168              04      10    11      19
1006EXCITER        965    421    5                 1  25
ALT1    5          671              04      10    12      13        19
1007SYNTHESIS      540    421    5                 1  25       32
ALT1    5          394              04      10    12      13        19
1008TWO-WIRE       171    421    5                 1  25       15
ALT1    5          203              04      10    11      19
1009SW ASSY        406    421    5                 1  25       19
ALT1    5         1080              04      10    11      19
1010REMOTE I/O     243    421    5                 1  25        4
ALT1    5         1223              04      06    20
1011CON MATCH      185    421    5                 1  25       17
ALT1    5          257              04      10    11      13        19
1012AUD PS         223    421    5                 1  25        7
ALT1    5          156              04      10    11      13        19
1013AUD I/O        271    421    5                 1  25       10
ALT1    5          173              04      10    11      13        19
1014AUD CON        198    421    5                 1  25        7
ALT1    5          453              04      05    20
2001CHAS FILT      658   6  1    5                 1  25       10
ALT1    5          172              04      16    19
2002AMP BD         333   1751    5                 1  25       12
ALT1    5          130              04      17    19      21
2003DECODER        168   1751    5                 1  25        1
ALT1    5          146              04      18    19
5001ONE-WATT       496   5  1    5                 1  25       19
ALT1    5          150              04      14    19
5002PWR SUPP       406   15 1    5                 1  25       22
ALT1    5          194              04      15    19      22
5003PA CHASIS      941   26  1   5                 1  25       80
ALT1    5          355              04      07    20
6001ANALOG         153    381    5                 1  25        5
ALT1    5          165              04      10    11      13        19
6002IVRCU PS        91    381    5                 1  25        8
ALT1    5          164              04      10    11      13        19
6003DECOD/TIM      120    381    5                 1  25        2
ALT1    5          526              04      06    20
6004MICRO          185    381    5                 1  25        2
ALT1    5          789              04      05    20
6005IVRCU CHAS     417   2  1    5                    25       25
ALT1    5          355              04      08    20
5004MTG TRAT       411  10  1   25                    17       21
ALT1    5            5
9999
3001ECCM PTS        25    251   55   22
9999
10001001      14007
10001002      27863
10001003      25974
10001004      12943
10001005      18861
10001006      11741
10001007      15686
10001008      22650
10001009      12840
10001010      44405
```

```
10001011     28818
10001012     32541
10001013     14892
10001014     21968
20002001     58850
20002002     92326
20002003    120522
30003001     12472
50005001     14350
50005002     30286
50005003     72195
60006001    151371
60006002    219843
60006003    291099
60006004    205617
60006005    178200
50005004   2273457
9999
```